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THE

PRINCIPLES AND PRACTICE

OF

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GYNÆCOLOGY.

BY

THOMAS ADDIS EMMET, M.D.,

SURGEON TO THE WOMAN'S HOSPITAL OF THE STATE OF NEW YORK, ETC.

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79

TO THE

MEMORY OF MY FATHER

JOHN PATTEN EMMET, M.D.,

MANY YEARS PROFESSOR OF CHEMISTRY IN THE UNIVERSITY OF VIRGINIA,

WHO DIED IN 1842:

AN HONEST MAN,

ESTEEMED BY ALL WHO KNEW HIM.

TO HIS EXAMPLE AND EARLY TRAINING I OWE MY SUCCESS IN LIFE;

IN YOUTH I AIMED TO MERIT HIS APPROBATION;

IN MANHOOD I HAVE STRIVEN TO BE WORTHY OF HIS GOOD NAME.

AND

This Book is also Dedicated

TO MY MANY FRIENDS IN THE PROFESSION,

WHO HAVE ATTENDED MY CLINICS AT THE WOMAN'S HOSPITAL:

TO THEM I FEEL IT SHALL BE WELCOME,

SINCE THEY WILL HAVE ALREADY PUT INTO PRACTICE MUCH THAT

IS NOW PRESENTED IN THIS NEW FORM

BY

THE AUTHOR.

PREFACE.

THIS work is essentially a clinical digest. It includes the results of my individual experience, and aims to represent the actual state of gynæcological science and art.

For the past twenty-five years I have devoted myself to the study and treatment of the diseases of women, and have been continuously engaged in the service of the Woman's Hospital of the State of New York since its opening in 1854. From 1862 to 1872 I was the surgeon-in-chief, with entire medical control and sole responsibility in the treatment of its inmates.

In the beginning the capacity of the hospital did not exceed that of an ordinary sized dwelling. In 1862, and subsequently, through the efforts of Mr. A. C. Wetmore, Vice-President of the Board of Governors (in whose honor the structure is called the "Wetmore Pavilion"), means were secured for erecting a handsome edifice, especially adapted for its purpose. It was built under my personal supervision, organized by myself, and brought to a high state of prosperity before any change was made in its management. In 1872 there were added to the medical staff three other gentlemen whose eminence in gynæcology is well known. They have shared with me the responsibility, and have done much to enlarge the reputation and usefulness of the institution, which, for several years, was the only hospital of this special character in the world. Up to the date of this reorganization about three-fourths of all the patients admitted had been under my care, and I had performed even a larger proportion of the surgical operations. To the enormous clinical advantages thus available have been added those of my private hospital, now in operation sixteen years, and those of an extensive consulting practice.

I have thought it proper to give this brief account of the clinical field from which such a large portion of the fruits herein presented have been gathered, in order to explain the individuality which the work may possess. In attempting to ascertain and formulate the laws which apply to diseases, and to analyze the results of treatment, I have compressed numerous histories and facts into a number of statistical tables, which present, in brief space, information that hundreds of pages would scarcely have sufficed to contain in detail. Their parallel, it is believed, is not to be found in the whole range of gynæcological literature, and if they unfold to others what I have aimed to put in them, I shall feel compensated for the labor they have involved. For two continuous years they kept me occupied in hours not required for professional work, and to the minutest detail they have been prepared by myself, for I felt that their value rested on their accuracy, which I could not have vouched for if their compilation had been committed to others.

In addition to my own experience, I have endeavored to record that of other authors whenever available, aiming always to include what I felt was useful, and to exclude rigorously what I knew to be erroneous in precept or practice, so that the work might faithfully mirror what I conceived to be the true aspect of gynæcology. It will be observed that, with the exception of the two plates taken from Savage's work, and some of the instruments, all the illustrations are original, the drawings having been furnished by myself.

If I have omitted to give due credit to any one for priority in, or special contribution to, the elucidation of any subject, it has been through inadvertence, for I would account no man's labor as my own.

For obvious reasons I have been silent upon all diseases and conditions not peculiar to women; and I have not thought it necessary to insert formal prescriptions in the work. No man can prove successful as a gynæcologist who has not mastered the principles of medicine, and stored up experience in the general treatment of disease. The competent practitioner knows that prescriptions must be varied with each case; to the incompetent, ready-made formulæ are but a snare.

From the first page to the last I have cherished the same deep sense of responsibility that every conscientious physician must feel at the bedside of a patient whose life is in his hands; and in committing this work to my brethren I can truly say that it reflects the best part of a career that has not been idle or lacking in earnestness of purpose, and, I trust, not spent in vain.

89, Madison Avenue, New York.
March, 1879.

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CORRIGENDA.

Page 43, 7th line from the bottom, *for* "eye" *read* "edge."
" 76, 17th " " " " *for* "fulness," *read* "feebleness."
" 79, in the last column of the table, *for* "vagina, and outlet of Fallopian tubes," *read* "vaginal outlet and Fallopian tubes."
" 119, 6th line from the bottom, *insert* a period after "out," and begin the new sentence with "After soaking in hot water."
" 261, bottom line, *for* "phthisis" *read* "phlebitis."
" 317, the title of figure 53 *should be* "Pessary (modification of Hodge's)."
" 652, the title of figure 115 *should be* "Recto-vaginal fistula, rectal surface."

THE PRINCIPLES AND PRACTICE
OF
GYNÆCOLOGY.

CHAPTER I.

THE RELATIONS OF CLIMATE, EDUCATION, AND SOCIAL CONDITIONS TO DEVELOPMENT.

Effect of the American climate upon longevity, nutrition, development, and generation—Are we to become an enfeebled race?—Early impressions on the nervous system are permanent, and are transmitted to descendants—Causes of imperfect development of young women—Active culture of the brain in the developing period incompatible with the normal growth and function of uterus and ovaries.

A THINKING man, who has had opportunities for observation, cannot divest himself of the apprehension that the physical development of the women of our land is becoming deteriorated. If this be true, the causes should be quickly sought out and removed, or we must eventually become an enfeebled race, after the human stream which has given us vigor ceases to flow into our country from other lands.

It has been asserted that the tendency is for all animals to deteriorate in this country, and indeed archæologists give abundant proof that several races of men had peopled the American continent and died out before our own occupied it. In few portions of the globe has there been a like occurrence from natural causes; nations have overrun and assimilated the previous occupants of a country, but, having once become populated, the land has continued to be occupied. The cause of this deterioration is as yet obscure, but the question as to whether the peculiar nature of our climate has a share in it forces itself upon us. When immigration to the United States shall have ceased, and our population shall have become more homogeneous, the problem will be somewhat simplified.

We certainly possess a most changeable climate, which taxes the nervous system at the expense of nutrition, and stimulates to constant action, rendering us a restless people in both mind and body. Rest and quiet recreation, in a European sense, are unknown to the mass of our population. We develop early, and live a life crossed by more than our share of dyspepsia, neuralgia, and other nervous disorders. The average degree of intelligence I judge to be greater in this than in any other country, on account of our heterogeneous origin. Our field of education is as extensive as, if not more so than, that of our neighbors, but it is more superficial. Profundity is granted to comparatively few, since the same mental application on which a German, in his own land, would thrive, will, in this country, impair the physical condition, or result in some serious nervous disorder. With no lack of perseverance, we generally accomplish an undertaking, but the end is gained only at the expense of a vast amount of wear and tear. We are, from necessity, eminently a practical people, and are always seeking the most direct method by which we may accomplish a purpose. In this peculiarity lie our hopes for the future.

We cannot escape the disadvantages of climate under which we live and pay so heavy a tribute for the privilege. But we can diminish the tax by protecting more fully the young, and especially the girl, until she has reached a degree of physical development which will render her less susceptible to disease, better able to perform her maternal duties, and capable of bringing forth an increased progeny. This development can be accomplished only by assisting nature to expend the full nervous force of the child in its organic growth, and by leaving the training of the brain to a later period of life.

On the approach of puberty the nervous system becomes the dominant element in the female organization, and is as susceptible to external influences as is the barometer to atmospheric changes. But the simile is not applicable later on, since an impression, for good or evil, once made upon the nervous system, especially while in the period of development, is, in all probability, never erased. It may lie dormant in the after life of the individual if circumstances do not occur to bring the consequences again into view, but the impression will be transmitted through the child to future generations.

It is in the developing period of life that the young girl lays the foundation of a defective organization, whenever nature's laws have been disregarded. She will then be rendered liable to local disease before marriage, to sterility afterwards, or to the life of an invalid from the birth of her first child, and her enfeebled constitution will be transmitted to her offspring.

The life of a boy and girl is passed side by side with an equal degree of development until the eleventh or twelfth year. From this time forth, until old age, their life lines diverge. The boy gradually develops from birth to manhood; the generative function with him is perfected without special tax to his nervous system, and stimulates his physical growth even when he is placed under disadvantageous circumstances. Defects in physical education can be counteracted, in after life, to a much greater extent in the male than is possible in the female.

With the female the transition to womanhood is rapid; her organs of generation become the chief power in the complex organic system, and to reach the necessary co-ordination she passes through the great crisis of her life. Her nervous system is fully taxed in securing this harmony of action, and in preserving it afterwards. The slightest defect in her organs of generation will, through the sympathetic system, produce functional derangement elsewhere. If the defect be a serious one, nutrition throughout the body becomes impaired for the want of a healthy nervous stimulus. The original exciting cause of the disturbance cannot be remedied; growth is arrested; waste is not repaired, and atrophy follows.

With the first step to womanhood the young girl begins to live an artificial life as a tribute to a degree of civilization and progress which is only consistent in a general disregard of all laws of health. The "girl of the period" is made a woman before her time, by associating too much with her elders, and in diet, dress, habits, and tastes becomes, at an early age, but a reflection, on a reduced scale, of her older sisters. When she has reached the customary age to be introduced into society it is but a nominal step, since she is thoroughly conversant with it, and is as well able to look to her own interests as a veteran. She may have acquired every accomplishment, and yet will have been kept in blissful ignorance of the simplest laws of her own organization or requirements for the preservation of her health. Her bloom is as transient as that of a hot-house plant, where the flower has been forced by cultivation to an excess of development by stunting the growth of branches, and limiting the spread of its roots.

There are, fortunately, many exceptions to the rule, but society is so constituted that the most conscientious parent cannot entirely protect a daughter from the force of example, and to-day almost every young girl in the land suffers more or less from a pernicious form of physical and mental training.

A girl scarcely enters her teens before custom dictates a change in her mode of dress; her shoulder-straps and buttons are exchanged for a number of strings to be tied about her waist, and the additional weight of an increased length of skirt is added. She is unable to take the proper kind or necessary amount of exercise, even if she were not told that it would be unladylike to make the attempt. Imperceptibly her waist is drawn into a shape which was never intended by nature for the organs placed there, and, as the abdominal and spinal muscles are seldom brought into play, they become atrophied. Under any circumstances the abdominal organs are compressed and displaced. The woman needs, more than the man, full play of the abdominal wall, that with the descent of the diaphragm the venous blood may be aided in its return to the heart. It is true that by custom for centuries the waist of the female has been compressed, but the evil was to a great extent counteracted by the observance of laws for the preservation of health, now disregarded. Before puberty most girls have already begun to suffer from habitual constipation, a condition which is likely to last through life. From compression of the abdominal viscera, and from constipation, the venous circulation in the female pelvis becomes obstructed early in womanhood. This interruption to the current ends in permanent enlargement and over-distension of these vessels, a fruitful source of disease, as we shall see hereafter.

As soon as the change is made in the dress, from that of a child, custom demands also that she should be protected by veil and gloves from the rays of the sun, and she soon becomes as blanched as a well-cultivated celery stalk. And since the blood needs the chemical effect of sunlight acting directly on the skin, anæmia is established chiefly from the deprivation. This state of the blood is a potent factor in the generation of all diseases depending on impaired nutrition, and entails conditions likely to baffle all medical effort at their removal during the menstrual life of the female.

At this time, with the blood deficient in every element for proper stimulus to the nerve centres which preside over organic growth, an attempt is made to develop the brain. At the period of life when the young girl's whole nerve force is taxed for the full development of her organs of generation, we deflect this force by hard study, or, it may be, for the acquirement of some accomplishment, which in all probability will be forgotten or laid aside after marriage. The spirit of emulation which is cultivated in all schools has a deleterious influence on the nervous system of girls at any age, but particularly about the time of puberty, while those who are the least fitted to bear the strain are always the ones who make the most effort. Music also, from its emotional effect on a sensitive nervous system, has arrested the development of the ovaries and uterus of many a young girl. On looking over my case books I have been surprised to find the same statements repeated again and again, viz., that the sufferer had taken the highest honors at some noted female school or college, and gave no tangible signs of weakness until reaction took place after her return home.

I hold that it is not practicable to educate a girl by the same method found best fitted for the boy, without serious consequences afterwards. More than all, it is an impossibility to fully develop the ovaries and brain at the same time, for the growth of the former will be arrested. Even when the course of study has been comparatively moderate, functional disturbance is of too frequent occurrence to admit a doubt as to cause and effect.

We are indebted to the late Dr. Edward H. Clarke,[1] of Boston, for two valuable treatises on this most important subject, and already it is evident that promising results are to spring from his good work. I have long appreciated the necessity for some radical change in the mode of educating the children, and especially the young girls of this country, but to overcome the evil has heretofore seemed, indeed, a hopeless task in opposition to prejudice and pecuniary interest. I not only fully indorse Dr. Clarke's views as being in accordance with my own experience, but claim that the evil results are even more serious than he has represented.

I would advocate the highest degree of education for woman, in keeping with her means and station, but the wrong method and the wrong period of life have been settled upon for acquiring it.

To reach the highest point of physical development, the young girl in the better classes of society should pass the year before puberty and some two years afterwards free from all exciting influences. She should be kept a child as long as possible, and made to associate with children. Her dress, diet, and habits of life should be carefully looked after as if she were a child, and above all, the habit of regularity should be observed in all details. Her mind should be occupied by a very moderate amount of study, with frequent intervals, of a few moments each, passed when possible in the open air. There should be no studying at night under any circumstances. Each menstrual period should be passed in the recumbent position until her system becomes accustomed to the new order of life, and the habit of regularity established. She should neither expose herself nor over-exercise for twenty-four hours before the expected period, and during the time she should discontinue her lessons. When the menstrual function has become perfectly established, so as to be normal in character and free from pain, she can begin to increase the number of her studies, but at the time of the molimen she should observe the same rule of rest, mental and physical. Then let the young woman spend the same years in the completion of her education as are given by the young man to his collegiate course, when she will have reached a better age, and, with ordinary care, be in better physical condition for her work. This would necessarily delay her entrance into society for several years, and at the age of twenty-five, when she would have acquired her growth and full physical development, she would be better fitted to become a wife. If custom would allow some approximation to this plan, I believe the women of our country would bear more children, be better able afterwards to discharge their maternal duties, and would preserve their youth and vigor many years longer.

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[1] Sex in Education, or a Fair Chance for the Girls, Boston, 1873.—The Building of a Brain, Boston, 1874.

Women of the poorer classes menstruate, as a rule, later than those in the upper walks of life, but reach their full physical development sooner. This is the natural result of a simpler mode of life, by which even a certain amount of privation and want is more than counterbalanced by less waste of nerve force. A simple mode of life for the girl, therefore, fits the woman the better for an early marriage, and renders her more capable of discharging her duties as a mother.

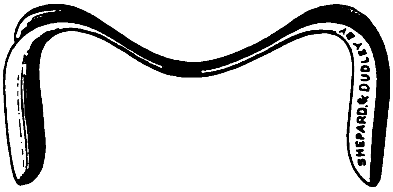
CHAPTER II.

INSTRUMENTS USED IN EXAMINATIONS.

Specula: Sims's, Emmet's—Depressor—Tenacula—Sims's copper sound—Emmet's probe—Sponge-holder—Long-nozzled syringe—Sims's elevator—Emmet's elevator—Applicator—Case of gynæcological instruments—Sponge tents—Method of preparing them—Emmet's uterine dilator, by sponge and by water—Rules for using sponge tents—Laminaria tents—Tupelo tents.

VARIOUS forms of specula are in use for examining the interior of the vagina, and each has its advocates, the favorite instrument being the one to which the operator has become the most accustomed.

Fig. 1.



Sims's speculum.

I have always used Sims's perineal retractor, or my own instrument constructed on the same principle. Dr. Sims's instrument has been modified in various forms, and new ones have been invented on the same principle with the view of dispensing with an assistant, but as yet nothing has been devised which can take its place. This instrument is so simple in design, and so perfectly does it fulfil every requirement, that it will probably never be superseded. The only objection to be advanced against it is that an assistant is required in using it. This, really, is an advantage in favor of the instrument, for an examination should always, if possible, be made in the presence of a third party. It is not necessary to have a trained assistant, for any one with ordinary intelligence can hold it sufficiently well, provided the operator himself understands how it should be held. It is of much more importance to know the proper position in which the patient should be placed for the examination, and this is the chief difficulty. The instrument is generally made too heavy, and too straight in its central portion. When too heavy it soon fatigues the hand, even of one accustomed to its use; and if made too straight it is apt to slip suddenly out of the vagina.

As long as the sole use of the speculum was to bring the cervix into view, and to facilitate the passage of the porte-caustique in the treatment of supposed ulceration, the cylindrical speculum sufficed. With the advance of knowledge in the treatment of uterine disease, it became necessary to gain more space and light, and the cylindrical speculum has gradually been superseded by various instruments with expanding blades to open out the upper portion of the vagina. But nearly every speculum of the kind that I have seen is so long that it displaces the uterus more or less, and by continued use tends to dilate the upper portion of the vagina. I have known both retroversion and prolapse of the uterus to occur in patients from repeated use of a valvular speculum which stretched the upper portion of the passage. The amount of space and light obtained by any of these instruments is very small in comparison with what is afforded by Sims's speculum, and they are useless for all surgical procedures.

The older members of the profession who have become dexterous in the use of some special instrument, cannot be expected to change or to appreciate the necessity for doing so. But for the younger members it would be well to begin with the use of Sims's speculum, if they wish to hold a position in the advance. Full justice, in the light of our present knowledge, cannot be done in the treatment of uterine disease by any other instrument than this perineal retractor, or some other based on the same principle, and like it capable of exposing the whole vagina.

In a single generation, the use of this instrument has advanced the knowledge and treatment of the diseases and especially the injuries of woman from profound ignorance to a front rank, if, indeed, not beyond that of any other branch of surgery.

My own speculum, or retractor,[1] has been in use some eleven years. When adjusted it is self-retaining, and in many cases can be used without the aid of an assistant. I have frequently used it in long surgical operations; and, if we had not Sims's instrument, I would recommend it as fulfilling every condition, since it acts on the same principle. The patient is placed on her left side in Sims's position, and the instrument is introduced into the vagina by the index finger of the right hand, and passed behind the cervix, while at the same time the perineum is firmly pressed back by placing the thumb of the same hand in front of the screw at *F*. As the instrument is held in this position, the screw *B* is turned sufficiently to revolve the vaginal portion into the hollow of the sacrum, and at the same time the fenestrated blade becomes imbedded in the soft parts on the upper buttock, with the effect of retracting the perineum. The screw *A* is for securing the blade at such angles as may be necessary. By means of the screw *D* the upper half of the vaginal portion is elevated, and with it the right, or upper, labium. The instrument is held in place by the blade on the buttock, but, as this surface is more or less movable, it sometimes allows the outlet of the instrument to sag, and the os cannot always be brought into view unless the patient is placed on a plane inclined from the operator. This difficulty, however, is easily overcome by the finger of an assistant on the upper part of the blade, and I have frequently made the patient hold it with a finger of the left hand, which, in Sims's position, is always drawn out from under her and lies up over her back.

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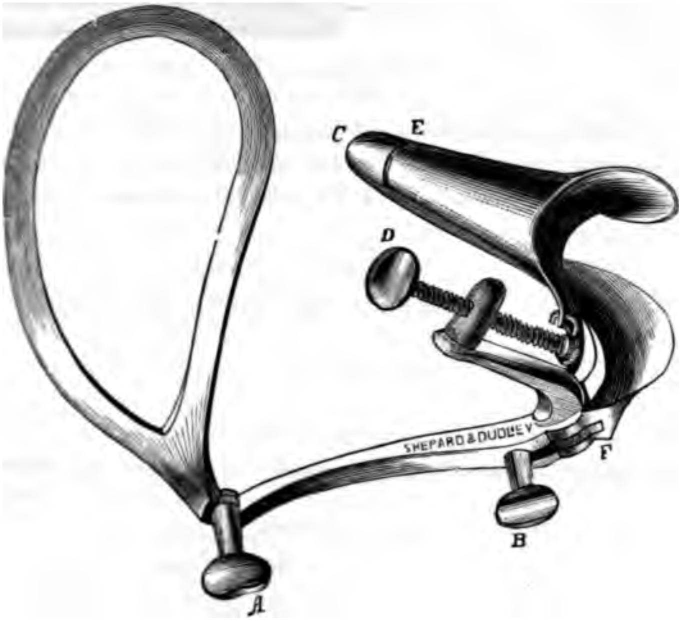
[1] This instrument has been credited to Weiss by Dr. Barnes, and to Mr. Spencer Wells by Dr. Churchill. But I presented the instrument to Mr. Wells during his visit to this country, and Weiss doubtless afterwards copied it.

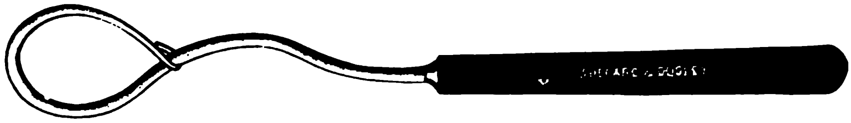
Fig. 2.



Emmet's retractor.

The depressor is frequently needed to push back the anterior wall of the vagina sufficiently to bring the cervix into view. It has been made as a spatula and in other forms, but the original instrument, made impromptu from a large silver-plated copper sound, cannot be improved upon.

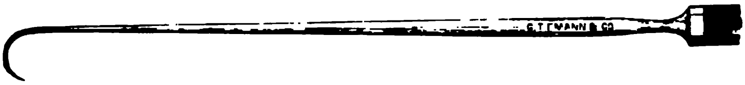
Fig. 3.



Sims's depressor.

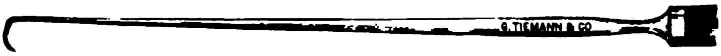
The tenaculum is necessary for seizing the cervix and bringing it into view, and for steadying the uterus while examining or making applications to the canal. I had the original instrument reduced in size, made much lighter, and the shape of the hook changed from a gradual curve to one coming off at nearly a right angle, with only a slight curve at the point. Both instruments are generally made too blunt, whereas the point should be as sharp as and taper like a needle. The larger tenaculum, introduced by Dr. Sims, answers for making examinations, and is often more useful on account of its strength and size, but the smaller instrument is better for seizing a portion of tissue to be removed in operations.

Fig. 4.



Sims's tenaculum.

Fig. 5.

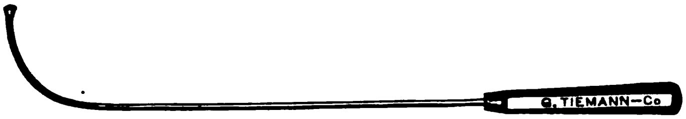


Emmet's tenaculum.

Dr. Sims, many years ago, had Simpson's sound made of copper, and reduced somewhat in size. This was indeed a great improvement, since it permitted the curve of the instrument to be changed whenever necessary. But I found it possible to be misled by it as to the actual position of the uterus, for when curved in accordance with the impression suggested by a digital examination, the uterus would sometimes conform itself to the sound. I therefore adopted the surgeon's silver probe, made longer and with a handle. I use the instrument simply to feel with, as it were, when the parts are beyond the reach of my finger, and as it is too delicate to move the uterus it cannot mislead or do harm.

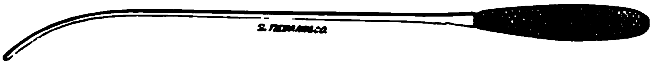
A piece of whalebone about eight or nine inches in length, with a rough thread cut on the end like a gun screw, is a useful device of Dr. Sims for swabbing out the vagina by means of cotton twisted around it. The cotton is easily thrown off when not needed, and is better adapted to the purpose than a piece of sponge. This stick is also very useful, as we shall see, in tamponing the vagina.

Fig. 6.



Sims's copper sound.

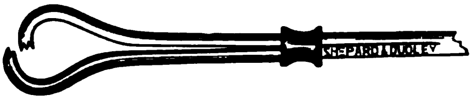
Fig. 7.



Emmet's silver probe.

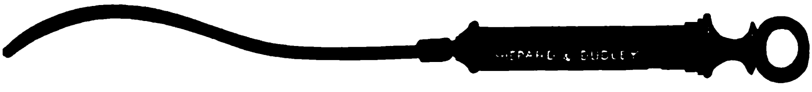
A number of Sims's sponge-holders are needed for surgical purposes, and for removing blood from the vagina in case of accidental hemorrhage after an examination. They should be made of iron, and galvanized, or copper-plated, which is better, with the handle of the same metal, and in one piece, for if made of bone or wood it soon becomes cracked from being placed in hot water.

Fig. 8.



Sims's sponge-holder.

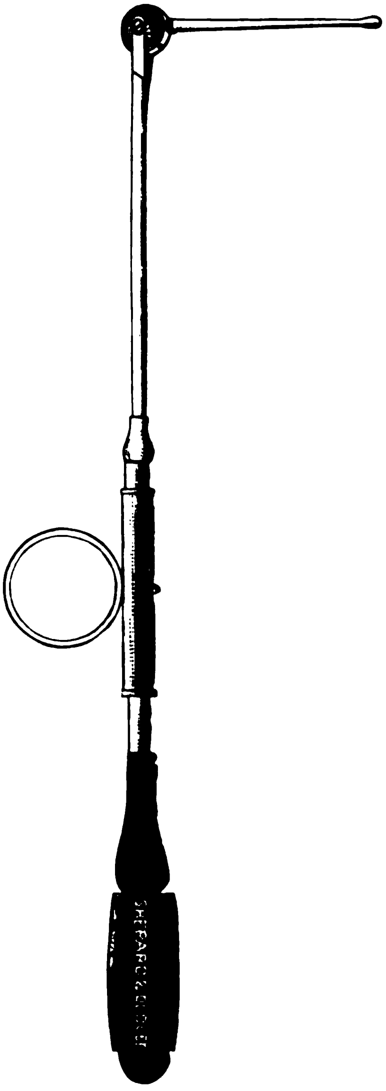
Fig. 9.



Long-nozzled syringe.

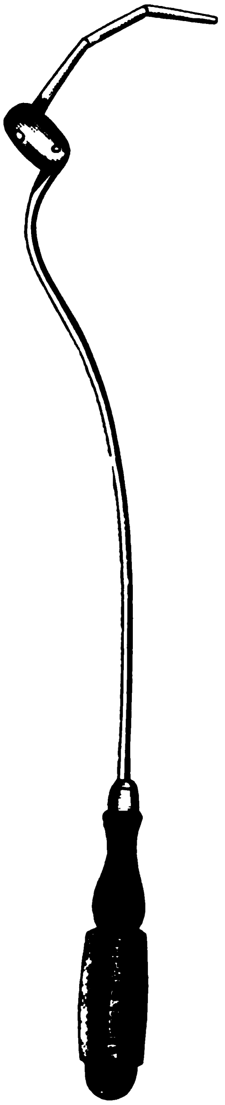
To remove the mucous discharge from the uterine canal I use a long-nozzled syringe (Fig. 9) made of hard rubber, which I bend to the needed shape, for introduction within the uterus, by heating it in the flame of a spirit lamp. To prevent the rubber from burning it is necessary to grease the nozzle well before heating it. When bent to the proper curve, the shape is retained by plunging the instrument into cold water.

Fig. 10.



Sims's elevator (half size).

Fig. 11.



Emmet's elevator (half size).

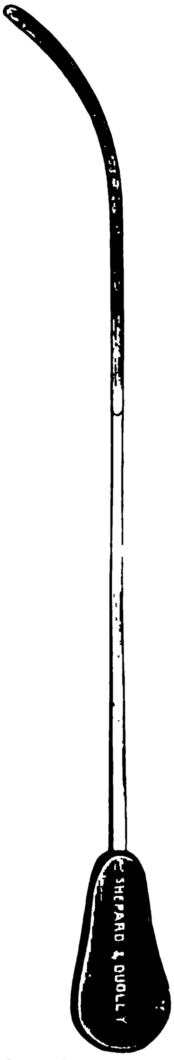
Some sixteen years ago, Dr. Sims devised an ingenious instrument for replacing a retroverted uterus (Fig. 10). The stem-shaped portion was introduced into the canal, when, by depressing the instrument and gently pushing it backwards into the posterior cul-de-sac, the cervix was made to pass under and beyond the fundus, and the organ became anteverted. This was a most important advance from the old plan of replacing the uterus with Simpson's sound, a procedure always attended with risk, even in the hands of an expert, for the weight of the uterus, at the fundus, rests on the point of the sound, and it is always difficult to judge of the amount of force employed, or of the existence of adhesions. With Dr. Sims's instrument the fundus is not reached, the uterus rests on the bulb at the base of the stem, and, with ordinary precaution, the slightest resistance can be appreciated. The only objection to the instrument is found in using it in a narrow vagina, or a shallow posterior cul-de-sac, when it cannot be withdrawn from the uterine canal without again partially retroverting the organ.

This difficulty led me to have the uterine, or stem, portion divided into three jointed segments, movable from the straight position only in a forward direction (Fig. 11). By pressure backward, the three segments are brought into line, and the stem is as unyielding as that in Dr. Sims's instrument. The uterus is replaced in the same manner as with his instrument, but the joints allow the portion in the uterine canal to be withdrawn without disturbing the corrected position of the uterus.

I have for years used Sims's elevator for estimating the relation of the uterus to an abdominal growth. A stylet runs through the instrument, and by a spring in the handle is made to slip into a series of holes in the bulb, so that the uterine portion can be locked at any angle. When introduced into the uterus and thus secured, the organ is entirely under the control of the operator. On moving the uterus in any direction by means of this instrument in one hand, we are able to judge of its relation with an abdominal tumor by placing the other hand upon the abdomen.

The applicator (Fig. 12) is designed for introducing medicated fluids within the canal, in the treatment of uterine disease, and for arresting any accidental bleeding that may follow an examination. This instrument, as well as the probe, should be made of pure silver, and not of coin metal, or it will soon break from a frequent changing of the curve. As generally made and sold in the shops it is almost useless for the purpose, as it is too long, and, being of the same thickness throughout, it bends so readily upon itself that it is difficult with it to reach the fundus. It is often made of German silver to which a portion of coin silver is welded, but this is objectionable also, as the two soon separate. The end of the instrument is sometimes inserted for so short a distance into the handle, which is generally of wood, that it is easily broken. It should be made from a rod of silver about one-eighth of an inch square, gradually tapering to half this width and thickness, but not rounded, except near the end. The handle need not be larger than that of a grooved director, which is of sufficient size to be grasped between the thumb and forefinger, and the whole can be made in one piece. When complete, the instrument should be about eight inches long. The probe should be made in the same manner, of one piece, but much lighter, and gradually tapering from the handle; the edges should be rounded off for half the length, and terminate in a button.

Fig. 12.



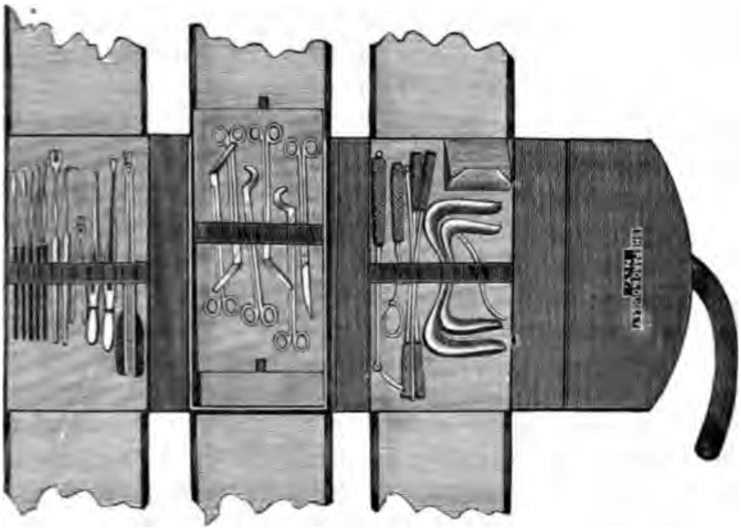
Emmet's applicator.

The illustration (Fig. 13) on the next page represents a convenient and compact case made to contain the instruments which have been described, and others to be spoken of later. In the middle compartment are placed the scissors and other instruments which would be injured by being twisted in the rolling or folding of a case. Beneath these is space for the speculum and sponge-holders.

Sponge tents are indispensable for dilating the uterine os and cervix, to detect the source of a hemorrhage, and to ascertain the position and size of any growth within the canal. They are also very serviceable in the treatment of certain conditions which will be referred to hereafter. Their use is frequently followed by serious consequences, from the want of proper care in their preparation, from a lack of judgment as to when the condition of the patient justifies their introduction, and from neglect in caring for the patient afterwards.

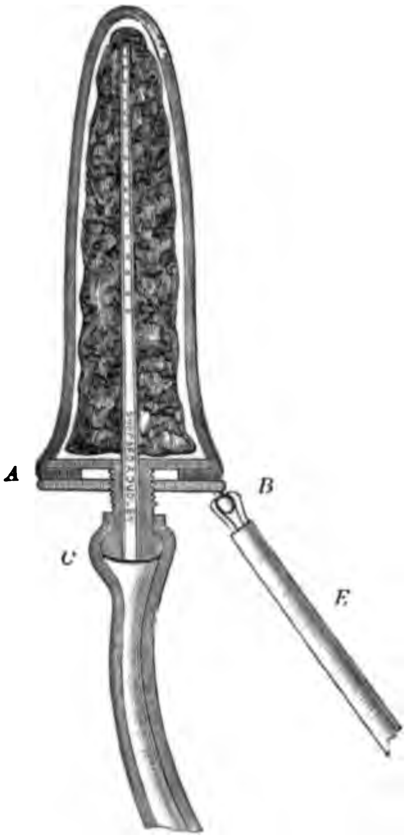
Their proper preparation is of sufficient importance to warrant the surgeon charging himself with that duty, and if this be impossible, he must delegate it only to a competent and trustworthy person. The sponges should be carefully selected, and of rather a coarse quality, but free from sand and shells. At first they must be thoroughly washed with soap and hot water, the impurities picked out as far as possible, and then exposed to the action of the sun for a day or two. The sponge is next cut up into cone-shaped pieces of different sizes, which are trimmed of their inner edges, but as far as possible the outer portion of the sponge should be preserved, as it makes a smoother surface upon which to wind the cord. The pieces should again be thoroughly washed in hot water to which a little of Squibb's impure carbolic acid has been added, and again carefully picked over, to remove any sand or shell which can now be easily felt in so small a piece. The gum Arabic should be of the best quality, and the solution a saturated one. An instrument with a handle, like a straight awl (a broken tenaculum answers very well for the purpose, but it should be a little longer than the sponge), is passed through the sponge, which is then dipped into the solution and wrapped. The cord should be a strong one, but not large, and the wrapping must be begun by two half hitches at the larger end, so that it will not slip. The tighter the cord is drawn the better, and it should be served evenly throughout, and at the end finished by half hitches. Not only is the sponge to be compressed in its diameter, but also shortened as much as possible by crowding it down on the staff as it is being wrapped. It is very de-

Fig. 13.



sirable to have the tents made in this manner, so that they may expand in length and advance beyond the point to which they are introduced. When the cord has been secured, the staff is withdrawn, and the tents dried rapidly before a hot fire or in the sun. When nearly dry, but still pliant, a number of them should be bent in different curves, and allowed to harden in the form given them. After they have become thoroughly dry the cord may be removed, and the tents are then ready for use. They require no wax, and are preferable without it, since the coating occupies a space which otherwise would admit a larger tent. The roughened surface left after removing the cord is an advantage in preventing the tent from slipping out, and it does not injure the mucous membrane since it softens as soon as it comes in contact with any moisture.

Fig. 14.



Emmet's sponge dilator.

A great deal of irritation, and frequently inflammation, is caused by forcing a straight tent into a curved canal. It is, therefore, a great advantage, and one which I have appreciated for ten years or more, to have the tents conform to the curve of the canal. This is ascertained by means of the probe, bent and carefully introduced until the exact curve is obtained. If the proper tent be then selected, it can be introduced without difficulty, and will cause but little irritation afterwards.

Fig. 14 represents a sponge dilator which I designed in 1870, and I have found it useful for making a final dilatation of the uterine canal previous to performing an operation. Through a disk of hard rubber passes a brass tube, which is perforated by a number of small holes at the upper portion, and is open at each extremity. This tube is passed through the centre of a sponge tent of suitable size, the tent is then covered by a thin India-rubber cot or bag, and its mouth stretched over the edges of the disk. The free edge of the cot which has been drawn over the disk is then secured, compressed between the under side of the disk and the brass plate *A B* on screwing up the latter sufficiently. The brass disk *A B* has attached to it on side at *B*, a knob which can be grasped by a pair of forceps, the limbs of which are closed by sliding forward the canula *E*. When the knob *B* is held by the forceps, a ball-and-socket joint is formed, which will admit of any motion within the radius of a sphere. To the bulb at *C* is attached a piece of India-rubber tubing, a foot or more in length, through which water is introduced for swelling up the tent, and at the end of the tube is a stopcock. To the other side of the stopcock a Davidson's syringe may be joined, or what I have found to answer better, a thin India-rubber bag, such as are used for pessaries, with tube and stopcock. The dilator is introduced by steadying the cervix with a tenaculum in one hand, and by holding the forceps and tubing in the other the proper direction can be given to the instrument. When it has been introduced within the canal to the proper depth, a small amount of water is to be thrown in before removing the forceps. As the tube occupying the centre of the sponge is open at its extremity and its sides perforated, the water will make its exit at the upper portion, and dilatation will extend from above downward, so that the instrument cannot slip out. Enough of the sponge is dilated in a few moments for the purpose of retention, so that the forceps may then be removed by sliding back the canula. I direct the patient to lie in bed on her back, and to place on the abdomen the air bag, which has been filled with water, from which a sufficient supply to fully dilate the sponge is made to flow by occasionally compressing the bag with the hand.

I generally leave the dilator in place for some twelve hours, unless there should exist some special reason for more rapid dilatation. The instrument is easily withdrawn by placing the patient on her back, removing the bag, and turning the stopcock for the escape of water from the sponge. The forceps can be passed along the index finger into the vagina and attached to the instrument, when it can be withdrawn, guarding against displacing the uterus by holding the finger against the cervix.

The chief advantage of this dilator is that it greatly reduces the risk of blood-poisoning, and if we could dispense with the unprotected sponge in the first instance this danger would be entirely obviated. Fortunately, when this does occur, it is seldom from the use of a single tent, and, if the precaution be taken, which I always insist upon, to wash out the canal thoroughly whenever a tent is removed, we will greatly lessen the risk. It is also a great advantage gained from the use of the dilator that the mucous membrane is not injured, and consequently we have no bleeding from the canal when it is removed.

The disadvantages are that we can seldom dilate to the same extent as can be done by the tent alone. The resistance offered by the uterine wall will yield to the steady pressure of the sponge, but the elasticity of the India-rubber bag is persistent, and will to some extent counteract the force of the sponge. Consequently we are obliged to use a cot much larger than the sponge, which will occupy an additional space, and therefore makes it necessary that the canal should be partially dilated before the dilator can be introduced.

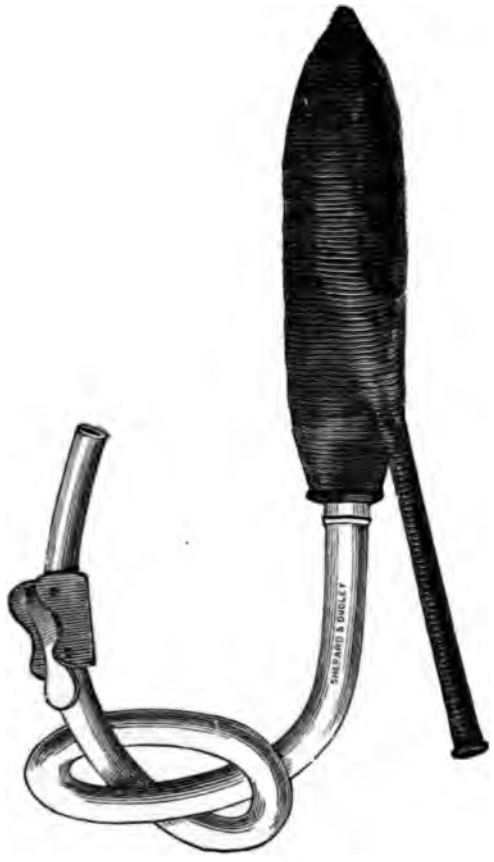
On the other hand, this dilator has the advantage that the force cannot be concentrated at any one point, but must be exerted throughout, as the sponge gradually dilates. I have used the instrument several times for rapid dilatation, and it answers the purpose, but unless there should be a necessity for doing so, the more gradual process is to be recommended, as attended with less risk in surgical procedures; but the contrary is true in obstetrical practice. For rapid dilatation, however, it has no advantage over any other instrument of the kind, as at first the water escapes outside of the sponge when rapidly thrown in, and becomes the dilating power, but as soon as the sponge has had time to expand, it absorbs the water and the pressure then becomes uniform. With other dilators, where water is the medium employed, the power is much greater, but a large portion of the force is always lost in the direction from the os to the vagina, and if the parts do not yield readily above, the bag becomes ruptured below. This is the chief objection to Barnes's dilator; a large portion of the bag becomes expanded in the vagina and will frequently burst at this point, unless there is sufficient space in the uterine cavity for its expansion in that direction.

This difficulty I have overcome by the design of an instrument which can be introduced with the greatest facility. It can, moreover, be held in position until dilated sufficiently above to keep it from slipping out of the canal.

The small opening at the end of an India-rubber cot is stretched over a hard rubber button, and held from slipping by being compressed between it and a disk, which is screwed into position as shown in Fig. 15.

In fact, the same arrangement will answer for both purposes if the perforated tube can be removed on which the sponge tent is held. This cot is entered at the side, and below, by a tube closed at the upper end, which lies full in its cavity, but is long enough to reach the end of the dilator. Through this tube a copper sound is to be introduced to the end, for the purpose of carrying the top of the bag to the fundus. If necessary to facilitate its introduction, the sound can be bent in any direction, and the bag will, of course, conform to the same.

Fig. 15.



Emmet's water dilator.

A piece of tubing of sufficient length to project beyond the vagina is attached to the button, and the nozzle of a Davidson's syringe is to be inserted into the other end. The top of the bag is to be held at the fundus by means of the sound, throughout the operation, or until a sufficient quantity of water has been thrown in to dilate it enough to be retained.

On the tubing is shown a simple contrivance by which its sides can be firmly compressed by turning up the little tongue of metal. After fully distending the bag, and then compressing the sides of the tube by this cheap substitute for a stopcock, the dilating force can be exerted continuously with but little loss of power. After an interval of a few moments, more water can be thrown in, and by degrees, with a little tact, the uterus can be fully dilated by this means as rapidly, if not even with more facility than with any other dilator. The great objection to this, in common with all soft rubber instruments, is that, unless recently made, they cannot be relied upon to stand a continuous strain without bursting. Yet this will bear far more than any other, since it is supported so uniformly by the uterine walls. This instrument might be made of larger sizes for obstetrical purposes; and would answer exceedingly well for bringing on labor by rapid dilatation of the os uteri.

I have found it often most serviceable for arresting hemorrhage, particularly when due to soft growths, or to some diseased condition of the mucous membrane. It is of great value after a tent has been used, to increase the dilatation at the time of operating for the removal of some intra-uterine tumor. For the purpose of making an exploration of the canal, ten or fifteen minutes will often be sufficient. But such rapid dilatation should never be employed unless in some urgent case. When a tent has been first used if pregnancy exists, or at the time of hemorrhage, there will be less risk from rapid dilatation. Under other circumstances, this procedure is always attended with the danger of exciting inflammation.

Rules for the Use of Sponge Tents.—Before introducing a sponge tent for the purpose of dilating the uterine canal, it is well to have the bowels moved, and to be satisfied that the patient is not suffering from the effects of recent cold or any other special disorder. But above all, a tent should never be passed into the canal if there has been an attack of cellulitis so recent that a vestige of thickening remains, or if the slightest tenderness on pressure can be detected by the finger in any part of the vagina.

The operator who does not inform himself fully as to the condition of the patient in regard to any old cellulitis that may have existed, and as to the fitness of the patient for the operation, is criminal in his neglect, since, with all the care that a conscientious man may be able to exercise, bad results will sometimes follow the use of this agent.

When the uterine canal is curved, a tent must be selected, as I have already shown, of a similar curve; and it is better to use several small tents than a single very large one. Select a size which can be easily inserted, and around this several thinner ones can be passed into the canal. Each tent should have a string attached by a double half hitch to its base, and before its introduction, it should be dipped into glycerine as it will expand rapidly from the moisture furnished by this agent, which is, moreover, a disinfectant. I make it a rule to place the patient in bed immediately, applying heat by some convenient means to the feet, and, if the weather is cool, the sheets should be previously warmed. I never allow a patient, under any circumstances, to get out of bed, so the bladder must be emptied by means of a catheter, or into a bed-pan. The greatest care must be exercised to guard againt exposure to cold; she must be kept quiet, and an enema of some preparation of opium administered, should there be pain enough to call for an anodyne. When the pain is severe, and is not relieved by the opiate, or if a sensation of chilliness is experienced, it is better to remove the tent, and make another attempt at dilatation at some future time. The nurse is always directed to give a large vaginal injection of warm water night and morning, with the addition of a little carbolic acid, if there should be much discharge. A tent is seldom allowed to remain in the uterine canal longer than twenty hours when used for diagnostic purposes.

While the patient lies upon the back the tent can be removed by holding the string in one hand, while pressure is made downward and backward with the index finger of the other hand against that portion of it nearest the cervix. If, however, the tent is a large one, it is best to bring the cervix into view with Sims's speculum, and with a pair of strong forceps twist the tent upon itself until it becomes loosened through reduction of its diameter. It can now be withdrawn, but before it is entirely removed from the canal, reverse the twist that the sponge in expanding may again take up the fluid which was expressed from it.

To facilitate a diagnosis of the condition within the uterine cavity, it will be necessary to place the patient on her back, with the lower extremities drawn up. Then, as the index finger of one hand is passed within the uterus, the other hand is to be placed over the abdomen to steady the organ, and at the same time to gently press it low enough into the pelvis for the finger to reach the fundus, if the uterus is not too much enlarged. After the examination has been made, the uterus must again be lifted by the finger to its proper place in the pelvis, and the cavity well washed out with warm water. This can be done with the patient lying on her back, a bed-pan being placed under her, and the nozzle of Davidson's syringe passed into the uterine cavity; or, the patient may be placed on the left side, the speculum introduced, and the water thrown in and withdrawn by means of the long curved-nozzle syringe, shown in Fig. 9. If the uterus has been well dilated, the best position for the purpose is on the back, as its cavity can then be thoroughly washed out. But to facilitate the escape of water and clots from the uterine canal, the index finger of one hand should be inserted just within the os, and the perineum kept simultaneously well retracted by pressure with the back of the hand. After the injection has been given, the dilator or another tent can be introduced if necessary, the patient being again placed in bed and treated in the same manner as during the first dilatation. If the uterus is not to be again dilated, I make it a rule to apply Churchill's strong tincture of iodine freely to the cavity, either by means of the applicator or by injecting a small quantity to the fundus from a long-nozzled syringe. The effect of the iodine is to cause rapid contraction of the uterus, and it is also a good disinfectant; afterwards, the patient should be replaced in bed, and kept quiet until the next day.

There are many in the profession who would ridicule the necessity for any such caution as I have advised, but I have had some unhappy experience in times past, which might have been guarded against with my present knowledge. For years I have followed my present plan, and in no instance will I introduce a tent in my office and allow the patient to return home. As a rule, I have insisted upon the patient remaining for the time in my private hospital, and have only made the exception to treat a patient in her own house when I have felt satisfied that my directions would be fully carried out. Every year's experience has but the more confirmed me in the correctness of my views.

The sponge tent is not only needed for dilating the canal, that we may be able to form a diagnosis, but is a most valuable aid in treating certain forms of uterine disease, as will be shown hereafter. Almost every one in practice has at some time experienced the bad effects and even disastrous results following the indiscriminate use of sponge tents; more care, therefore, must be exercised by the profession, or a valuable means will eventually fall into obloquy. Sometimes, from a comparatively slight provocation, an attack of cellulitis or blood-poisoning may occur; at others, again, the degree of tolerance shown is most remarkable.

Some ten years ago, a fashionable lady in this city was under my care for frequent hemorrhage. The uterus was four inches deep. It became necessary to dilate the uterus, and as she resided quite near me, she came to my office for the purpose of having me introduce a tent, one about three inches in length being used. Feeling anxious, I accompanied her to the carriage, impressing on her the necessity for carrying out my directions by remaining quietly in bed, and I saw her drive in the direction of her residence. As soon as my back was turned she directed her coachman to drive to Stewart's, where she purchased the materials for a dress; then went to a mantua-maker, stood for a long time to have it fitted; returned home in time to dress for a dinner-party, and afterwards went to a ball, where she danced until a late hour. On the following day, after my office hours, I called at her house, and found that she had gone out early. I called frequently, and finally wrote requesting that she would appoint some hour when I could see her, but, in despair, I was obliged to await her pleasure. Fortunately, no bad results followed, but I was unable to see her until the fifth day, when she called at my office for the purpose of having "the nasty thing" removed. I was thankful to be allowed the privilege of removing it, but I informed her that she would have to seek further treatment elsewhere. She did not need it, however, as she was afterwards cured, for the granulations which had existed in the canal were destroyed by the long pressure of the tent, and, from the continued drainage and stimulus exerted by its presence, the uterus returned rapidly to its natural size, a result which she certainly did not merit. Other agents have been employed for the purpose of dilating the uterine canal, but none possess the same capacity as the compressed sponge, and are consequently of but little value for surgical purposes or as aids in diagnosis. The laminaria digitata, or sea-tangle, it was thought would supersede the use of the sponge, and would lessen the risk from blood-poisoning; but apart from its limited dilating capacity there are other objections to its use. It has been found to expand unequally throughout its length, so that it may dilate fully at one or each end, and consequently become exceedingly difficult of removal. It will also cause frequently more irritation than the tent, from being stiff and unyielding, and as it expands much slower it is more difficult to keep it from slipping out of the canal. When the os is contracted and so small that a tent of proper calibre would not be firm enough to pass, a short section of laminaria is found useful to open the canal of the cervix for the subsequent reception of the tent.

Dr. G. E. Sussdorff, of New York, has recommended,[1] as a substitute for the sponge tent, the root of the tupelo tree, or the nyssa aquatica, which is found in the swamps of the Southern States. This agent is far superior to the laminaria, but has not the dilating power of the sponge tent, yet it is a very valuable acquisition.

Dr. Goldsmith, of Atlanta, Georgia, has employed tents of the compressed pith of the cornstalk for the purpose of dilatation. Unfortunately, this substance does not possess the dilating capacity of the sponge, but I have found it very useful for treating certain conditions of the uterus, to be referred to hereafter.

[1] The Medical Record, New York, July 14, 1877.

CHAPTER III.

SURGICAL INSTRUMENTS AND APPLIANCES.

Scissors of various curves—Ball-and-socket knife—Needles—Sims's needle-holder—Emmet's needle forceps—Sims's feeder—Twisting forceps—Sims's shield—Double tenaculum—Sims's blunt hook—Counter-pressure hook—Silver wire—Mode of freshening surfaces, before the introduction of sutures—Silver sutures, and mode of introduction.

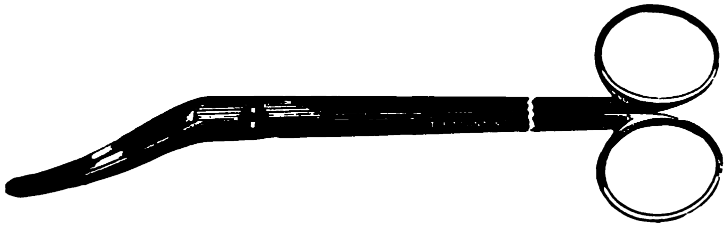
Mode of administering vaginal injections of hot water—Foster's vaginal syringe—Vaginal tampon; its use and mode of application.

Scissors.—For some fourteen years I have used scissors almost exclusively, and have been instrumental in their introduction for the various operations about the female organs of generation, in preference to the knife.

With the scissors a surface can be thoroughly freshened in less time, and with less bleeding, from which latter cause much delay or an abandonment of the operation was formerly of frequent occurrence, when the knife was used.

I make use of four pairs of scissors, two of which have each a large curve to the blades, right and left, and two a smaller curve, also right and left. Those represented in Fig. 16 are of a lesser curve and are the most needed for general use. The other pair (Fig. 17) is invaluable, when properly made, for denuding a surface high up in the vagina, or running across the axis of the passage. It is almost impossible to represent these scissors by a diagram; the dip of the

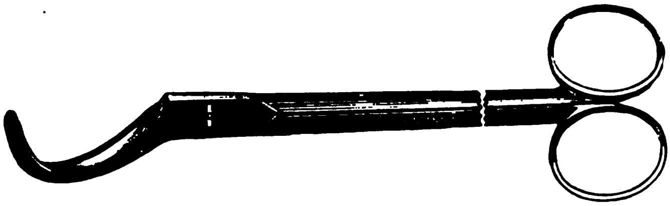
Fig. 16.



Emmet's scissors.

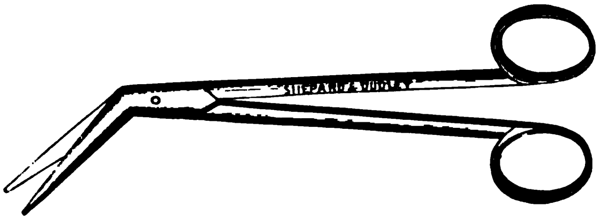
blades from the handles is about thirty degrees, and their curve a quarter of a circle, with the extremity, or cutting surface, somewhat prolonged at a tangent. The blades at the joint are vertical, but they gradually twist upon themselves until they cross each other at their extremities in the horizontal. Some idea of the double curve given the smaller scissors may be obtained by resting the forearm on a table, with the hand rotated outward so that the backs of the fingers will also rest upon the table when semiflexed. A large number of these scissors sold by the instrument-makers are worthless, having no resemblance to the proper shape. Necessarily, each blade represents a different arc of a circle, and they must be so accurately adjusted that their cutting edges will not come in contact except near the points. Even where the shape has been preserved, the instrument is found frequently to be of little value, for, owing to bad workmanship, the blades cross each other and come in contact from the heel to the point. The result is, that the joint becomes strained from the first use, and it is impossible with them to remove a continuous strip in consequence of the blades being so close together that there is not room between them for the tissues to pass, and hence only a single bite can be removed at a time.

Fig. 17.



Emmet's scissors.

Fig. 18.



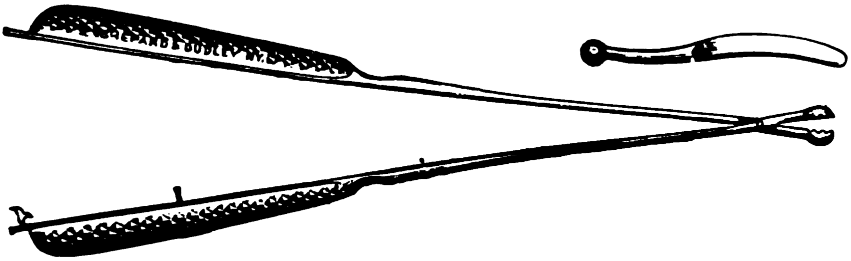
Emmet's scissors.

The remaining pair of scissors to be described is shown in Fig. 18.

They are used chiefly for dividing cicatricial bands in the vagina, for paring flaps, and for dividing the cervix backwards. These scissors are blunt pointed, bent at an angle, and not curved to either side.

Occasionally a knife is necessary at some inaccessible point, and the ball-and-socket knife, Fig. 19, will be found useful. Sixteen years ago, Dr. Sims introduced a knife, for dividing the cervix laterally, which had a single joint, so that the blade could only be moved as the radius of a single circle and was locked by a screw in the joint. About two years afterwards, I devised the above instrument, of which the handles are represented in the figure at half size, and the blade without reduction. The shape and size of the blade are like that in Dr. Sims's instrument, but the joint being a ball-and-socket the blade can be placed in any position, and firmly secured by locking the handles.

Fig. 19.



Emmet's ball-and-socket knife.

Needles.—The round needles have the advantage of making only a punctured wound, which will be filled up by the suture. I was the first to advocate their use for all operations about the vagina. The needles in general use, which are spear-pointed or triangular in shape, with a cutting eye and many times the diameter of the wire, frequently cause, in vascular tissue, a troublesome oozing after the sutures have been secured. Sometimes also a small fistula will remain along the track if, by chance, the course of the suture is too close to the bladder.

The needles I generally use are from one-half to three-quarters of an inch in length and round, with a slight curve near their point, thickest at the eye, which is counter-sunk to receive the thread. The smallest sized needle is used for fistula in the bladder or rectum, and for other operations in the vagina. The next size answers best for closing lacerations in the cervix. The largest one is an ordinary sewing needle, of a large size, thick and strong, and with a large eye deeply counter-sunk. This needle I use for closing a lacerated perineum, and the abdominal walls after ovariotomy. When the tissues are dense and cicatricial, as frequently found about the cervix, it is often exceedingly difficult to introduce the round needle. But when in this condition they are less vascular, and, consequently, the use of the round needle is not so necessary. With this condition I frequently use the lance-pointed needle (Fig. 22), which is very easy of introduction; but when the tissues are soft and vascular the round needle should be used. The needle-forceps, Fig. 23, first introduced by Dr. Sims, are unequalled for their firm grasp and the ease with which they thrust the needle through the tissues at any angle. But I have had an instrument made with shorter jaws (Fig. 24), which gives still greater facility for introducing the needle. The handles are rough and flattened, so that they can be firmly grasped in the palm of the hand, and a spring is placed between them, so that the needle can be freed as soon as the pressure of the hand is relaxed. One jaw should be deeply serrated and the other lined with a plate of copper, by which means the eye

Fig. 20.

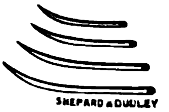


Fig. 21.

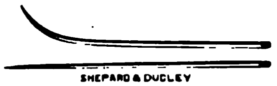
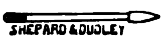
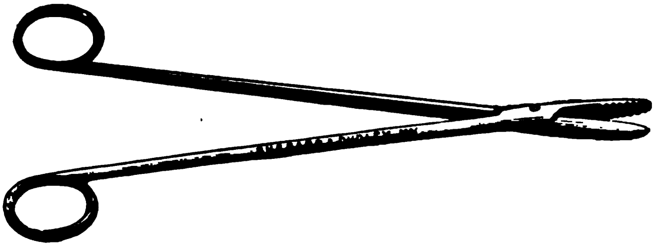


Fig. 22.



Emmet's needles.

Fig. 23.

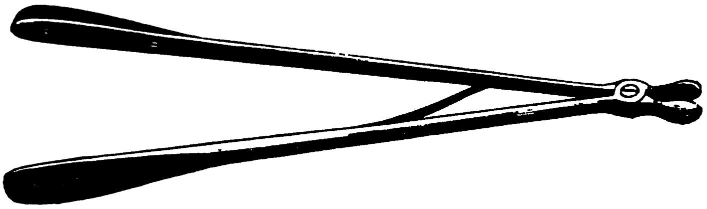


Sims's needle-holder.

of the needle is less likely to be crushed than it would be between two rough steel surfaces.

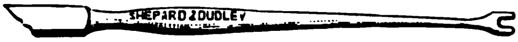
The "feeder" (Fig. 25) is a shallow forked instrument, devised by Dr. Sims, and is very useful to facilitate the passage of the suture when introduced in such a direction that it would cut into the tissues if traction had to be made at a sharp angle to its course.

Fig. 24.



Emmet's needle-forceps.

Fig. 25.

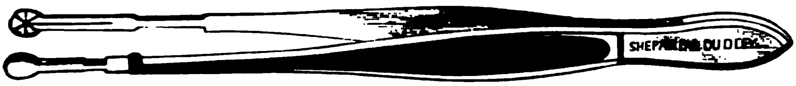


Sims's "feeder."

A pair of good dressing forceps will answer for securing the wire to the silk loop by which the metallic suture is to be introduced, but I use an instrument like the needle-forceps (Fig. 24). A short angle of the wire is to be hooked into the loop, flattened by the forceps, and twisted once or twice on itself.

The twisting forceps I have modified from the shape first used by Dr. Sims, making the jaws quite straight, and changing the mechanism by which the instrument is closed.

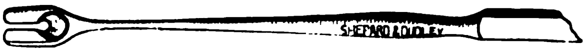
Fig. 26.



Emmet's twisting forceps.

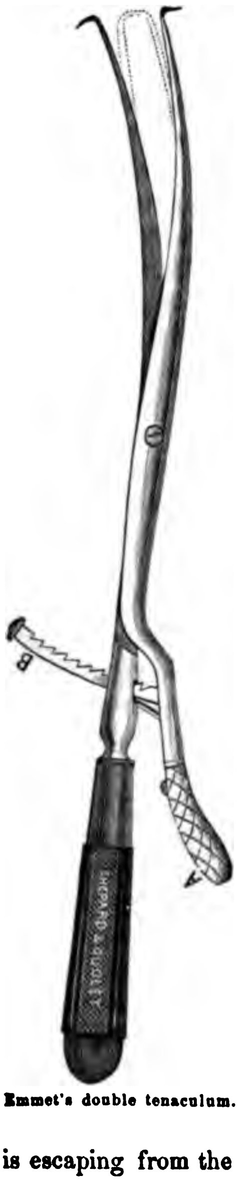
Sims's shield, Fig. 27, is used for steadying the sutures and as the guide to the proper point at which the wires should be twisted. This

Fig. 27.



Sims's shield.

Fig. 28.

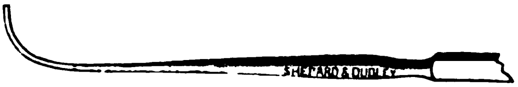


Emmet's double tenaculum.

instrument was formerly made of steel, but I found it more useful to have it constructed in one piece of copper, and silver-plated. When made of copper it can be bent at any angle, so as to rest flat on the surface through which the sutures have been passed. The instrument sold is seldom properly made, for the edge, at the bottom of the slit, over which the wire is to be twisted, is left too thick. It is necessary that this surface should have a thin edge, or the sutures cannot be twisted up to the proper point.

The double tenaculum, Fig. 28, is used for operations about the cervix, for steadying the uterus when making applications within the canal, and when operating within the uterine cavity. It is to be held in the left hand, and on depressing the thumb piece at A the tenacula are made to separate, by which the parts are put on the stretch. They are brought together again by drawing back, with the index finger, the ratchet bar at B.

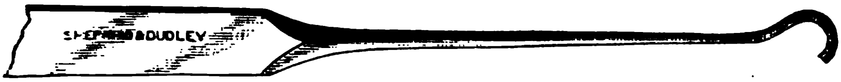
Fig. 29.



Sims's blunt hook.

The blunt hook was used by Dr. Sims for the purpose of detecting small openings, and is, in fact, a steel probe. Fig. 30, which I had made, may answer the same purpose, but its chief use is for counter-pressure as the point of the needle is escaping from the tissues. A pointed tenaculum is generally used for this purpose, but, being so slight, it is easily broken or bent out of shape. The whole instrument should be made in one piece of hardened steel, and of a size too large to bend or break.

Fig. 30.



Emmet's counter-pressure hook.

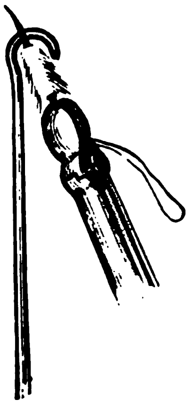
Mode of Freshening Surfaces before the Introduction of Sutures.—When two surfaces are to be united by sutures, they should always be denuded to an equal extent, so that no portion of the line, when brought together, will be left to heal by granulation. If the parts are free from cicatricial tissue, and are freshened to a broad, smooth, uniform surface, and if the edges are accurately approximated, without tension, and the sutures do not cause strangulation, from being twisted too tight, we will usually obtain union by the first intention. It should be our object to secure as near an approximation as possible to this form of healing in all operations about the vagina, since any surface left to heal by granulation becomes more or less cicatricial, and will contract afterwards. In denuding a surface, it is better always to begin at the lowest point and pass upwards, for in this way we prevent the flowing of blood over the surface as the trimming progresses. At the starting-point, the tissue to be removed is caught up by a small tenaculum, and cut away, by either the scissors or the knife, in as continuous a strip as possible. I frequently remove the whole surface in a long and single strip, by which I am assured that no portion has been left undenuded.

The Silver Suture, and Mode of Introduction.—Various substances have been used for sutures in the different operations about the female organs of generation. Silver wire made from virgin silver annealed is far superior to any other metallic suture; but the article generally sold is made from coin silver, and is not as servicable as the best quality of iron wire. The expert who brings the surfaces properly together will frequently obtain good results, irrespective of the material used; but the silver suture has come into more general use than any other. By the operator who understands its application, no valid objection will be advanced against it, since experience has demonstrated its superiority. The metallic suture had been previously employed, but to Dr. Sims is due the sole credit of establishing its use. Since June 24, 1856, Dr. Sims[1] has used the interrupted suture in all operations, having found that it simplified the performance and fulfilled every indication. When I was his assistant in the Women's Hospital I witnessed the results demonstrated by him, and since that time my experience has fully confirmed his views.

The wire may be attached directly to the eye of the needle, and thus introduced; but it is liable to kink. The best plan is to pass first a silk, or thread, loop, and use it for drawing in the wire. The eye of the needle must be sufficiently large to admit both ends of the thread to form the loop, and this should be about six inches long. The needle must be large enough to admit of its ready passage with a half knot, which is to be made close to the eye to prevent the thread from slipping out.

With a tenaculum to steady the parts, the point at which the needle is to be introduced is caught up, and the needle is inserted just behind it. The needle is then advanced by the forceps into the tissues, and as soon as the point appears its progress is aided by making counter-pressure with the blunt hook passed over the point, as shown in Fig. 31. When it is through as far as the head of the forceps will admit of, the exposed portion of the needle is to be seized and drawn entirely out, counter-pressure being continued with the blunt hook.

Fig. 31.



As each loop has been introduced, it is better to follow at once with the wire, for the silk soon becomes weakened after being saturated with blood or urine. The wire is to be attached to the thread-loop, as already described, and flattened with the wire-forceps, so as to offer no resistance in its passage. When a number of sutures are required, to save time and some confusion afterwards, shorten each suture by drawing it well through, make a small loop in the short end, and pass the long one through it, to be held by the assistant behind the speculum until needed for twisting.

The use of the "feeder" has already been referred to, and Fig. 32 shows its application. The suture A is held in one hand, and, by means of the instrument in the other, it is made to pass through the tissues in the direction B. Frequently, the suture would cut through without the use of this instrument, if the traction were made at a sharp angle to the line of introduction. Each suture should be made to include a liberal amount of tissue, and, as a rule, from four to five should be introduced to the inch.

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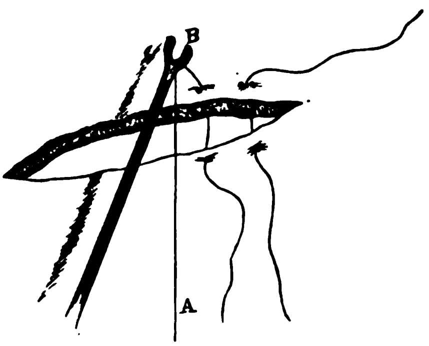
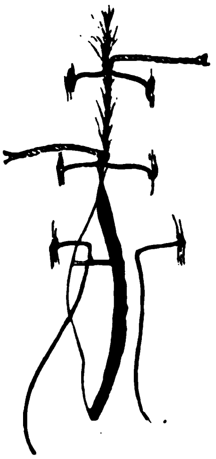
[1] See Silver Sutures in Surgery (p. 21), by J. Marion Sims, M.D., New York, 1858.

Fig. 32.



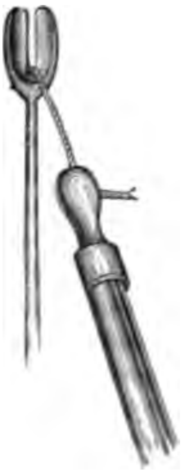
It was formerly thought necessary for the sutures to be introduced with the greatest care, so that the points of entrance and exit should be equally distant from the edges of the two surfaces to be united. The principle is correct, for it is important to avoid the approximation of a freshened surface with an opposite portion which has not been denuded, since no union would take place, and the line would be weakened. But, in reality, to introduce the sutures with any such accuracy is almost impossible, even under constant practice, and with the parts most favorably situated. Within a reasonable limit, this great accuracy is unnecessary if the sutures are properly "shouldered" at the time of securing them, so that the point of twisting shall be immediately over the line of union; in other words, each end of the suture must be bent on itself flat to the vaginal surface at the point of exit, and again at a right angle just over the edge of the surface to be united. Fig. 33 represents surfaces brought together by two sutures, which have been bent in the manner described, and secured by being twisted up to the angle over the line to be united, while the lower suture has been "shouldered" in like manner, but has not yet been twisted. If the suture be carefully bent at a right angle over the line, and only twisted up to this point, it is evident that there can be no turning in of either border. We generally introduce first the suture most distant from the operator, and continue in this order, for by doing so we are

Fig. 33.



able to avoid all confusion as each in turn is held over the upper side of the speculum by the assistant. Therefore, when we begin to twist the sutures, it will be generally most convenient to secure first the suture nearest to the vaginal outlet, which will also have been the last one introduced. In other words, having looped together the ends of each of the wires as introduced, and placed them under the hand of the assistant holding the speculum, we twist the sutures in inverse order from that in which they are passed. By following up, with a tenaculum or blunt hook, either strand of wire from the edge of the surface to be united, we can easily disengage its fellow from the others, since they have been looped together. We then hold the long end of the wire in the left hand, and shorten the loop by traction, to about three-quarters of an inch in length. With the twisting-forceps the little slip-knot is seized so as to make sure that both ends of the suture are included within its grasp, and the excess of wire is cut off close to the instrument. Sufficient traction is made on the silver loop, with counter-pressure from the flat side of the tenaculum, to bring the edges together, then each strand is shouldered properly, as already described.

Fig. 34.

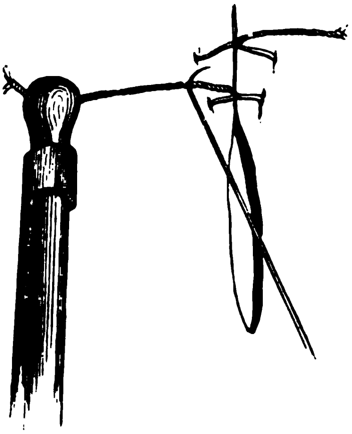


After introducing the loop within the slit of the shield, bring the forceps and the handle of the former close together, as shown in Fig. 34, and twist until the angle formed by the crossing of two strands of wire is lost, just at the edge of the slit in the shield. If this edge has been made as thin as possible, over which the suture is to be bent by moderate traction, as the instruments are brought together, and if the twisting is not carried beyond a given point, it is evident that with ordinary care the denuded surfaces only will be brought into apposition.

Drawing up of the suture with too great traction, and continuing the twisting beyond the proper point, so as to strangulate the parts included within the loop, can be the only cause for a metallic suture ever cutting out, if the parts are in a healthy condition, and have been properly freed from tension before the operation.

As it is very necessary that each suture should lie flat on the vaginal surface, after it has been secured, withdraw the shield, and, while still grasping the suture, pass a tenaculum (see Fig. 35) beneath the twisted portion, close to the line of union, in order to lift it up; bend the wire down, by moderate traction, over the tenaculum used as a fulcrum, withdraw the tenaculum, and press the wire down with it near the end of the forceps, as the latter is made to bend the wire upward again in the opposite direction. Cut the wire just at the angle thus made, and it will be found that the suture will be perfectly flat. The angle where the suture is to be cut off, should be made about half an inch from the line of union. Where there is room to admit of doing so, it is well to turn the sutures alternately to opposite sides, as a guide afterwards for their removal, as some of them occasionally become imbedded in the tissues.

Fig. 35.



The proper time for removing the sutures is usually between the seventh and tenth days, but this will be more specifically stated when treating of the special operations. They are removed by gently elevating each in turn with the forceps, and clipping the nearest side of the loop, so that, as the suture is withdrawn, it will continue to bind the parts until cleared.

Hot-water Vaginal Injections.—It will be shown hereafter that the hot-water vaginal injections, of different degress of temperature, according to the circumstances of the case, will prove an invaluable aid in the treatment of all conditions of uterine disease. It is, therefore, of the greatest importance that they should be administered properly. When given in the upright, or sitting position, the effect is merely to wash out the vagina without otherwise exercising more than a very limited influence. Experience has shown that the full benefits of these injections can be obtained only by administering them while the patient is lying on the back, and that she cannot efficiently give them to herself. It is also necessary that her hips should be elevated, and the quantity of water used should not be less than half a gallon for each injection.

A bed-pan of proper shape and size is indispensable to protect the clothing of the patient. The one known in the crockery shops as the English bed-pan, but now somewhat out of use, answers the purpose very well. For temporary use, the India-rubber inflated-cushion bed-pan will answer, but it is liable to stick together from the effects of the hot water.

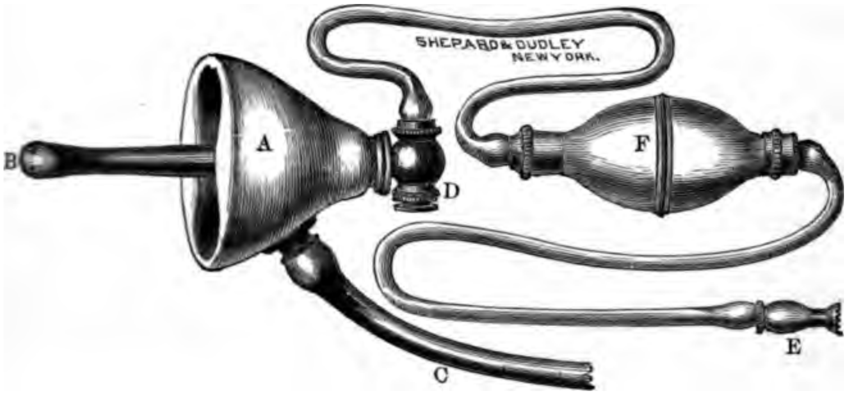
The shovel-shaped French bed-pan, more in general use in the sick room, does not answer for this purpose, as it allows the clothing of the patient to become wet. When using the regular bed-pan, it is necessary to place the patient so far forward on it that her weight will not tilt it up. Or the handle, which is hollow, may be turned to one side, and with a piece of large India-rubber tubing stretched over it, the water be made to pass off into a receptacle placed along side of the bed. For use in my private hospital I have this form of bed-pan made of copper, and, instead of so large a handle, a small spout which can be kept closed when not needed, by screwing on a cap. When a large injection is needed, the cap can be removed, and a small piece of tubing, placed over the spout, will carry off the water.

The injection can be better given to the patient after she is undressed for the night and in bed. She should be placed near the edge of the bed with the hips elevated as much as possible by the bed-pan, and a small pillow under her back, the lower limbs being flexed. Her body must be covered, to protect her from cold, and her position made perfectly comfortable ; whenever the bed is a soft one, for the purpose of keeping the hips elevated, a broad board should be placed under the pan to prevent it from sinking into the bed from the weight of the patient. The vessel of hot water is placed on a chair by the bedside, and the nurse passes the nozzle of the syringe into the vagina, over the perineum, directing it along the recto-vaginal wall until it has reached the posterior cul-de-sac. The water must be thrown in, at first, very carefully, until the vagina has become distended. If the nozzle is not properly introduced, a stream of water may be thrown directly into the uterine canal. The forcible entrance of any fluid into the undilated uterus causes intense pain, frequently alarming symptoms of nervous prostration or collapse, and sometimes it is the cause of an attack of cellulitis. At the completion of the injection, the vagina can be emptied by depressing the perineum for a few seconds, with the finger on the nozzle of the syringe before withdrawing it, and, as the bed-pan is removed, a napkin should be placed against the vaginal outlet to absorb any water which may have been retained.

When, from the force of circumstances, the injections cannot be thus administered, it is better to use a fountain, or siphon, syringe than that the patient should attempt to give them to herself. This mode, however, can only be regarded as a substitute, for it is never as efficacious. In any event the same elevated position of the hips is necessary. A steady stream is never as serviceable as the interrupted current from a Davidson's syringe. Hence it would seem as if, in addition to the heat of the water, the jet from the syringe acted as a stimulus to excite the bloodvessels to contraction.

Dr. Frank P. Foster, of this city, has had constructed an arrangement by which the bed-pan can be dispensed with, but an assistant is necessary to administer the injection. A cup or shield A, Fig. 36, is made by depressing one half of an India-rubber bag into the other half, and screwing the two together at D. This point is pierced by the pipe of a Davidson's syringe, and fixed in position by a brass cap. On compressing the bulb F, the water is forced directly through the vaginal portion, or nozzle, of the syringe, which is pierced with a number of small holes. Now, as the soft India-rubber cup A is held over the labia, the only escape for the water is by the tube C into a receptacle. The nozzle B is attached by a short piece of tubing to the brass cap D, so that it is movable. It is necessary that the patient's hips should be elevated so that the vagina may be kept fully dilated, and only the surplus water flow off by the tube C. This arrangement is far superior to the fountain syringe, and, if the patient can be kept dry under all circumstances, it will prove a most valuable contribution. The doctor has demonstrated for me the working of the instrument on several cases, none of which were selected, and there was no leakage of any consequence in any, but I think the shield might occasionally get displaced, as the nurse has to hold it firmly against the labia

Fig. 36.



Foster's vaginal syringe.

while, at the same time, she is giving the injection. This difficulty, however, can be easily overcome by attaching two straps from the cap D, one to be passed under the patient's back, where it will be secured by her weight, and the other over the pubes, to be held by her hand, so that, after the shield has been once adjusted, it can be kept firmly in place.

Vaginal Tampon.—The efficiency of a vaginal tampon consists in controlling uterine hemorrhage, and, at the same time, making uniform pressure on the vaginal walls, by which much of the blood supplied to the uterus is cut off. To put in a tampon properly is an accomplishment possessed by very few. The plan followed, of passing in with the finger a few pieces of oiled rag, a little loose cotton, or one portion after another of a roller bandage, is worse than useless. It is impossible to tampon the vagina effectually without the aid of Sims's speculum, for the mere stoppage of the escape of blood from the vaginal outlet is not sufficient when the accumulation continues unsuspected in the upper part of the vagina. When the uterine hemorrhage is free, we must prevent its escape from the os, as far as possible, for which it may even be necessary to tampon the lower portion of the uterine canal. There is no danger of the uterus enlarging from concealed hemorrhage, as after labor, nor do I think the probabilities are any greater of the escape of blood through the Fallopian tubes into the peritoneal cavity. The formation of a clot within the canal will excite the uterus to contraction, by which it will be forced out into the vagina. This is just the condition we wish to bring about, for as the uterus contracts, its vessels are compressed, and, consequently, the flow of blood will be checked.

The best material for tamponing the vagina is damp cotton. Soak a quantity of it in water, and squeeze the mass nearly dry. Then wet it again thoroughly in a saturated solution of alum, and again squeeze out the fluid. But before the cotton has become too dry, it must be separated into portions, so that when the edges are turned over, and the mass compressed between the hands, each portion, or pledget, will be about two inches square, and half an inch thick. If the pieces are then placed one on another, they will not become too dry before they can be used.

Before introducing the tampon, the bladder must be emptied, and the patient placed in the proper position on her left side, and the speculum introduced, all the blood and clots must be first removed from the vagina, and the whole passage mopped out with a piece of damp sponge held by a pair of long dressing forceps, or in a sponge holder. When the bleeding is profuse, it is often necessary to make an application of iodine to the uterine cavity, to excite contraction. After a portion of cotton has been properly twisted on the applicator, and the instrument has been bent to the curve of the uterine canal, it is to be dipped into the iodine and passed to the fundus. I frequently leave the cotton in the canal, to get the fuller effect from the iodine, and it can be done with safety if a portion of it is left projecting from the os. If we wish to leave the cotton behind, it is only necessary to loosen it from the applicator, by giving the instrument several turns between the fingers in the opposite direction to that in which it was put on. The applicator will carry the cotton to the fundus, and it is then only necessary to apply the nail of the index finger against one side of the instrument, as it is withdrawn, to cause the cotton to slip off and lie at full length in the canal.

We should begin the packing of the vagina by placing over the cervix a pledget of cotton, dampened afresh with the solution of alum. Then roll up a mass and place it in the posterior cul-de-sac, close to the cervix, with a similar one on each side and in front, and a flat portion over all. Begin then to place the pledgets around the cervix in a circle, and fill in the centre. When the mass has been packed in, and reaches the vaginal walls, take a stout whalebone stick to press back the cotton from the sides, and, as room is thus gained, a portion of cotton must be slipped into place with a pair of dressing forceps. Continue thus to go around and around the mass, pressing it back from the circumference towards the centre, and packing in the pledgets wherever space is gained. When the vagina has become well filled by the tampon, this is to be pressed firmly back with the stick from the anterior wall of the vagina towards the hollow of the sacrum, and the speculum slipped in front of the mass. As the speculum is then drawn back by the assistant, the space left will extend nearly up to the uterus. This is to be filled in in the same manner, and the speculum withdrawn *pari passu*, until the whole canal shall have been firmly packed. No force should be used, but, by going around and around the mass, and firmly packing in, with the forceps, one small portion after another, we can gradually dilate the vagina, if necessary, until the whole basin of the pelvis is filled by the tampon.

It will be necessary under all circumstances to confine the patient to bed, and to give an anodyne if the tampon has been a large one; and the bladder will have to be emptied by means of a flexible male catheter. It is best, as a rule, to administer the anodyne by injection into the rectum, the preparation I generally use being the acetated tincture of opium. Or, if more convenient, a suppository of morphine and belladonna answers as well, but it must be passed high up into the rectum before the tampon is introduced. The most distressing symptom from a large tampon is due to pressure on the neck of the bladder. Should this irritation continue without relief from the anodyne, the position of the patient may be shifted across the bed, with her hips near the edge, and her limbs flexed, for the purpose of carefully removing a portion of the cotton lying near the neck of the bladder. With the index finger as a guide this may be done by forceps, or better by twisting the notched whale-bone swab-stick into each piece, which will remove the cotton, as a charge from a fowling piece is removed by the gun-screw. After pressure has been exerted for a few hours, the vessels will have had time to contract, so that, as a rule, a sufficient quantity of the cotton, to give relief, may then be removed with safety if the patient continues to keep the horizontal position. Notwithstanding the astringent and disinfectant properties of the alum, it will be necessary after twenty-four or thirty-six hours, to remove the tampon, since by that time it will have become offensive from being saturated with blood and the secretions. After its removal a large injection of hot water containing a little impure carbolic acid should be administered, to wash out the vagina thoroughly, after which the tampon may be replaced if necessary. As the flow will, in all probability, have been greatly lessened by the pressure of the first tampon, the second one will not need to be so large. Before replacing the tampon it is well to encircle the cervix with several pledgets of cotton saturated with glycerine. This fluid is not only a good disinfectant, but it will render the condition of the patient more comfortable by removing the heat and dryness of the vagina which habitually follow the use of the alum and tampon.

CHAPTER IV.

FORM FOR A RECORD OF CASES; MODE OF EXAMINATION; CHIEF POINTS FOR FORMING A DIAGNOSIS.

Blank form for records—Neatness in person and instrument—Examination table—Digital examination: its value; mode of making it; points to be noted—Conjoined examination—Physical signs of a retroverted uterus; of a flexed uterus; of a uterine fibroid—Enlarged uterus: differentiated from pregnancy, and from other bodies, growths, tumors, hemorrhagic collections, etc.—Condition of vagina, urethra, bladder, cervix uteri, perineum, rectum—Dilating the urethra, a reprehensible practice.

***Mode of using the speculum*—Points to be noted—Use of probe—Latent cellulitis.**

It is necessary that some record should be kept of every case, for future reference. While the fullest details on all points of practical value should be recorded, it is essential that this be done in a condensed form. When accustomed to keeping such records, we will be able, after a few questions, to form a sufficiently accurate opinion, as to the difficulty from which the patient is suffering, to lead us to seek information from her on the essential points only, so as to economize both time and labor.

When consulted for the first time, it is necessary to hear something of the patient's statement given by her own prompting, as she will, doubtless, have settled beforehand in her own mind the all-important features. Notwithstanding that they are likely to have but little bearing upon the case, the physician must patiently listen long enough for her to feel that it is being thoroughly investigated, for this will inspire confidence at the beginning. If she is nervous she should be encouraged to give her own statement, in order to give her time to collect herself, and fit her to answer intelligently afterwards, the necessary questions to be asked. But I make it a rule, after having fully heard the patient, and once having begun to record the history of the case, that she shall only answer my questions.

The following outline I generally use for my record of cases, and by filling in with the special points of each, a full history can be secured. It will be necessary to leave ample space in the case book for "First symptoms of disease," "Present condition," for what "Physical examination" discloses, and for the "After history and treatment." I give here the history of an imaginary case, one frequently met with in practice, and the portion printed in italics showing the methods of filling in.

DATE OF FIRST CONSULTATION. *Jan. 1st, 1876.* RECOMMENDED BY
RESIDENCE. *New York.* *Dr. John Smith,*
OR HUSBAND'S PLACE OF BUSINESS. *Wall St.* *New York.*

NAME, *A. B.* AGE, *30.* ~~SINGLE~~ MARRIED. AGE OF FIRST MENSTRUATION, *fourteen.* REGULAR *after two months.* *Slight* ~~NO~~ PAIN, IN THE BEGINNING OF, ~~DURING~~, ~~AFTER~~, THE FLOW. LASTING *four days.* GENERAL HEALTH *always good.* MARRIED *ten* YEARS. NUMBER OF CHILDREN, *one.* NUMBER OF MISCARRIAGES, *one.* AT *three* MONTHS. LAST PREGNANCY, *miscarriage, eight* YEARS SINCE. CHARACTER OF LAST LABOR, ~~NATURAL~~, ~~TEDIOUS~~, RAPID, ~~INSTRUMENTAL~~. IN LABOR *5* HOURS. *Had* DIFFICULTY AFTERWARDS *on standing from bearing down, with frequent desire to empty the bladder. Did not recover her strength. Unable to nurse her child. Received some local treatment, and improved previous to the miscarriage.* HAS NOT BEEN WELL SINCE *birth of child, worse since miscarriage.* BEGAN TO SUFFER AFTERWARDS FROM *constant backache, leucorrhœa, frequent show, pain down the limbs, irritability of the bladder increased, unable to stand or walk; constipation of the bowels.*

PRESENT CONDITION. *Has become exceedingly nervous; neuralgia of the face; leucorrhœa throughout the month, but more profuse after the period; menstruation somewhat irregular as to time, always a day or two too soon, lasting now six days, but the quantity is rather less than formerly; suffers now from painful menstruation, generally towards the end of the flow; has become more constipated, and suffers great pain after each movement of the bowels; irritability of the bladder has continued, and cannot walk or stand without increasing the pain in the back and down the limbs; can seldom sleep without an anodyne; frequent headaches; feels sometimes as if she would become insane; suffers from strange sounds and trouble in the head, as if from the dripping of water; has frequent attacks of palpitation of the heart; loss of appetite, etc.; dyspepsia; suffers from cold feet.*

PHYSICAL EXAMINATION DISCLOSES *laceration of the perineum, down to the sphincter; prolapse of the posterior wall of the vagina; uterus retroverted and enlarged; cervix lacerated on both sides to the vaginal junction, and flaps rolled out, covered with an extensive erosion; profuse cervical leucorrhœa; depth of the uterus three inches and a half.*

TREATMENT AND RESULT.

If we analyze the history of the above case, it will be seen that the patient was in good health until her labor. The first symptoms of disease, as stated, are so characteristic that there would be little doubt as to what would be found, even before a digital examination had been made. Her labor was unusually rapid, and attended with laceration of the perineum and neck of the uterus. As soon as she began to stand on her feet, prolapse of the posterior wall of the vagina commenced. The laceration of the cervix would retard the return of the uterus to its natural size, after the birth of her child, and consequently, from its increased weight, the organ would lie near the floor of the pelvis. Gradually, as the rectocele increased, the neck of the uterus would settle still further forward towards the vaginal outlet, in the direction offering the least resistance. This would necessarily throw the fundus of the womb backwards, and it would become retroverted just in proportion as it advanced towards the mouth of the vagina. As the uterus was crowded downward the two flaps in the lacerated cervix would be forced apart more and more. This would act as a source of irritation which would rapidly increase the size of the uterus, cover the flaps with an erosion, and cause a profuse leucorrhœa, with backache. With the increased weight of the uterus, pressure would be made on the nerves, causing pain in the limbs, and, from pressure and dragging on the anterior wall of the vagina, there would be irritation of the bladder. It may be that she had received some local treatment, and improved. It is not likely, however, that the laceration in the cervix was detected, nor the displacement corrected. The erosion chiefly caused by the secretions running over the parts, which had increased in quantity, from the effort of nature to relieve the congested condition of the uterus, was doubtless supposed to be ulceration, and held to be the chief difficulty. No doubt, the nitrate of silver was applied until the surface of the supposed ulcer become cicatrized. A temporary improvement took place in her general health, and, before a relapse could occur, she became pregnant. In consequence of the displacement of the uterus backwards, and the limited space to which it was confined in the hollow of the sacrum, the organ could not increase in size after a certain time. The larger it became, the more marked was the retroversion and the general disturbance, until, at length, as a consequence, miscarriage took place. This accident increased her difficulty, by leaving the uterus larger than it was before, so that all her old symptoms returned with greater force. From the increased retroversion, causing continued pressure on the rectum, habitual constipation was induced, followed by a fissure or crack in the anus, which necessarily added to the difficulty by reflex irritation. With this condition of the uterus, sterility and irregularities in menstruation now followed as a natural consequence. The leucorrhœa also kept up a continued drain, from which, and from the want of sunlight, she gradually began to suffer from the effects of anæmia, a condition in which the blood is so wanting in proper elements as no longer to act as a healthy stimulus to the nerve centres. This will fully account for her "trouble in the head," the irregular action of the heart, and for her nervousness, neuralgia, etc.

I have thus, in as brief a manner as possible, pointed out the practical bearing of the main features of this individual case. Hereafter we shall find different local causes producing the same general disturbance, so that many features of this case will be found, in some degree, common to every one passing under observation.

MODE OF EXAMINATION AND CHIEF POINTS FOR FORMING A DIAGNOSIS.

A patient once informed me that she had refused to submit to an examination because she noticed that the physician she consulted did not keep his finger-nails clean. This circumstance convinced her that if he was so negligent of his own person, he would be quite as likely to neglect the details of her case. Although her deduction did not necessarily follow, for her own protection it was well that she avoided the risk of an examination. A physician should always be scrupulously neat in his person, but it is particularly essential that he should, at least, keep his nails short and clean. When examining a number of cases, if negligent, he will frequently cause vaginitis, by transmitting secretions under his nail, from one patient to another. He should always wash his hands thoroughly before and after each examination, always using the nail brush after examining a patient suffering from a profuse vaginal discharge. Not only for the protection of the patient is the precaution necessary, but his sense of touch will be more acute just after washing his hands. It is equally necessary that every instrument used in an examination should be thoroughly washed, and where the secretions have been of a suspicious character, a little carbolic acid, or some other disinfectant, must be added to the water. I have found an ointment of boracic acid, in proportion of one part to six, very serviceable for common use, and keep it on my stand to lubricate the speculum and my finger when making vaginal examinations.

A table, four feet long, thirty inches in height, without the castors, and twenty-four inches wide, has been adopted for all operations and examinations in my private hospital. For my office practice, I have an invalid chair, made of the proper height and wide enough for the purpose. The patient takes a seat, and, when told to lean back by the nurse, is placed in the horizontal position by the upper portion of the chair turning down. Such a table as I have described, covered with several folds of a blanket and a sheet, with a small pillow, answers as well as, if not better, than an expensive chair made for the purpose. The only objection to the table is its formidable appearance, which, to a new patient, is perhaps suggestive of a surgical operation.

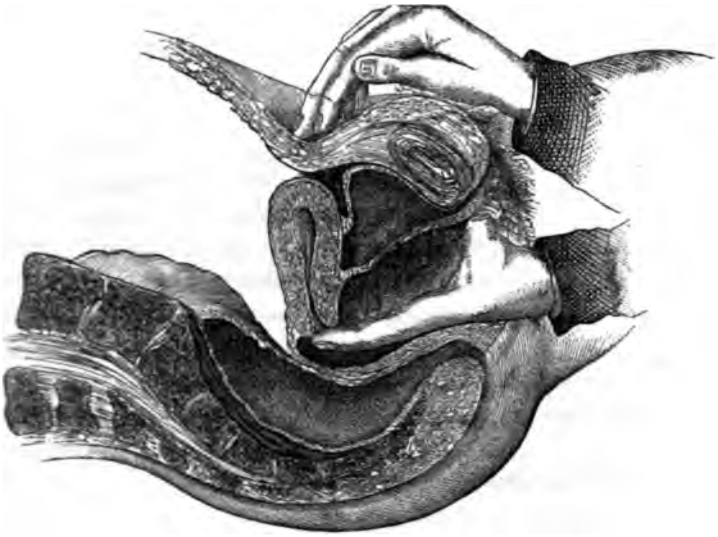
When the sense of touch has been cultivated, it yields more reliable information for forming a diagnosis than can be gained by the eye alone, even when used under equally favorable circumstances. Therefore the digital examination should be thoroughly and systematically made. It is all-essential to possess a knowledge of departures from a healthy standard, and, to detect slight changes, it is equally important to realize the fact that, the lighter the touch, the more thorough will be the appreciation of the sense. It is indeed remarkable what a difference in this respect exists between individuals. One will undertake the examination with as much vigor as he would use were he boring a hole into a pump-log, and is sensible to little more than the cervix, which feels like an obstruction in his way. He will gain no information of importance, and will inflict unnecessary pain on the patient. Another, in less time, will pass his finger lightly over every portion of the vagina, and quickly gain information enough to enable him to fully understand the case without having caused any pain. The manner in which I have sometimes seen this examination made, even by men of experience, could only be described as brutal, in consequence of the unnecessary amount of suffering inflicted, evincing a want of tact sufficient to debar them from the practice of any other branch of the profession.

A digital examination can be most thoroughly made by placing the patient on the back, her limbs drawn up, with her hips near the edge of the table within easy reach of the operator. She must be covered by a sheet, her knees separated fully, and her feet placed within six inches of each other. The index finger of the left hand is the best fitted for a vaginal examination, since its sense of touch is the more delicate, and the right hand is left free for palpation through the abdominal wall. After the hands have been well washed, and the index finger greased, the left hand is to be passed under the sheet along the surface of the table until reaching the sulcus between the buttocks. Then the index finger is slid along the perineum and over the fourchette into the vagina. When the finger has passed a short distance within the vagina, the perineum should be gently but firmly depressed for the admission of air, which will open up the passage and give sufficient space for the examination. After this the hand is to be rotated, with its palm uppermost, so that the curve of the finger may conform to that of the vagina: the other fingers and thumb being clearly flexed, so as not to touch the neighborhood of the clitoris. As the finger is advanced in the passage, the perineum must be pressed backward, until the cervix has been reached.

We must first note the position of the neck in the vagina, its size, shape, density, whether there be an erosion, and the size of the os. The position and size of the cervix will give some indication of the condition of the uterine body. All of these points are to be studied in their relation to sterility: and the shape of the neck if flexed, and any narrowing of the os will be of special interest, as causes of painful menstruation. There will perhaps be symptoms elicited in the history of the case indicative of cancer, and if this be present, it will be recognized by some characteristic growth or ulceration. But the ordinary erosion found on the neck possesses little importance beyond being an indication of some obstruction to the circulation. Unhealed surfaces may also be due to lacerations of the cervix—an injury occurring during childbirth, and these maintain the enlargement of the uterus, and keep up a profuse leucorrhœa. This is a condition frequently overlooked, yet it is one of the most important as a cause of disease, and its existence can often be detected by a digital examination alone.

We are now to place the right hand over the abdomen just above the pubes, and, by conjoined manipulation, with the finger of the other hand in the vagina, we are to judge of the size and location of the uterus. As shown in Fig. 37, the right hand is just about making the necessary pressure on the abdomen to bring the uterus within reach of the two hands, from which a very accurate idea can be formed of its size. By this means we are able to appreciate when the uterus is in position or when displaced forward, or to either side; but when turned backward, the finger in the vagina or rectum only can recognize the exact condition. For judging of the extent of growths on the outer surface of the uterus, and the relation of the organ to tumors in the neighborhood, this mode of examination gives us great facility. We are to obtain the first clue to the position of the uterus, from the finger in the vagina as it is passed around the cervix. With the aid of the other hand the impression received will be confirmed, or it will become evident that other means will have to be resorted to for settling the point. As the finger is drawn forward from the cervix, we will be able to feel through the anterior wall of the vagina and bladder whether the uterus lies in that direction. We must pass the finger to each side of the uterus to detect a lateral version, should one exist, and if a mass is felt on either side we must investigate the condition carefully; for when we find the uterus or a thickening in this location, it is to be supposed, until proved to the contrary, that inflammation has previously existed between the folds of the broad ligament, and in addition there will probably be found a laceration of the cervix on that side.

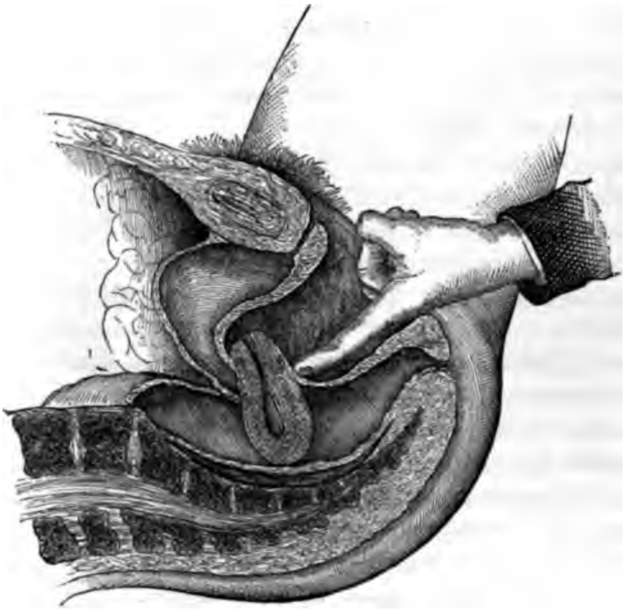
Fig. 37



Vaginal touch and bimanual examination.

When the uterus is retroverted, it lies backward, so that what was its posterior surface, when in position, can now be easily felt through the posterior cul-de-sac of the vagina, as shown in Fig. 38. We cannot always be sure that a mass felt in this position is the uterus retroverted, except in the extreme condition of displacement, as shown above. Here the neck will be felt pointing in the opposite direction from what it would when in a normal position, as will be seen at a glance by comparing this condition with that shown in Fig. 37. The uterus in Fig. 38 has rotated from a natural position through nearly a third of the circle, and we may, therefore, have the organ retroverted at any angle between these two points. We may find the uterus partially displaced backwards, and dragged over by a growth on its posterior wall, or we may find the parts thickened from a previous inflammation, so that it will be necessary to use the probe in order to ascertain the true condition. The body of the uterus is frequently bent upon itself, forming a flexure which cannot always be distinguished, by the finger in the vagina, from an outgrowth on the surface of the organ. For instance, in Fig. 39, it is shown that the finger would easily detect the sulcus at A and B, and with the uterus lying forward, the condition would be supposed to be one of anteflexion in both instances. At B, flexure of the body forward does exist, while at A is shown a fibroid growing out from the front of the uterus, with the canal unobstructed, and the organ nearly in position. By conjoined manipulation we might be able to detect the difference between the two conditions, but there would, in all probability, remain a doubt until the direction of the uterine canal is determined by means of the probe. If we reverse this condition we can easily imagine that the same difficulty would present itself in the diagnosis between a retroflexion and a partial retroversion due to a fibroid growing from the posterior wall, which question could only be settled by the same means. Bodies smaller than the uterus may sometimes be felt in the pelvis, with the uterus displaced, and it becomes of importance to detect their connection and nature. Either an enlarged and prolapsed

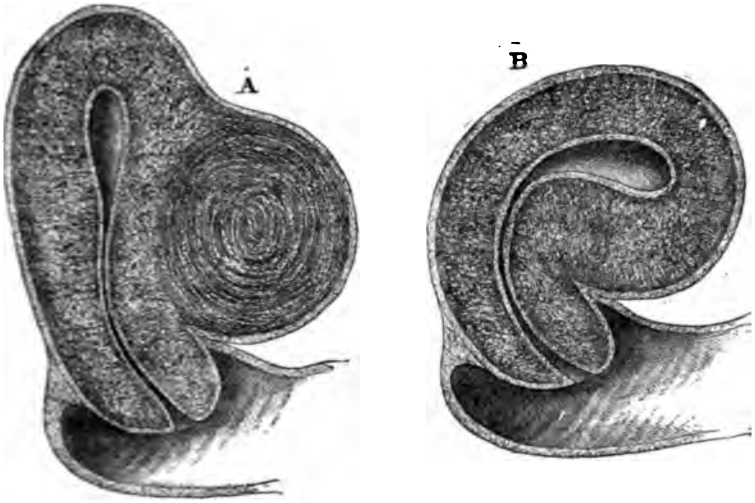
Fig. 38.



Retroverted uterus.

ovary, a cyst in the broad ligament, or a pedunculated fibroid may displace the uterus. An ovary enlarged sufficiently to prolapse will always be found in Douglas's cul-de-sac, generally under the retroverted uterus, and it is very painful on pressure. Its range is necessarily very limited, as it is confined to one side of the median line, and can be moved only in the direction from which it prolapsed.

Fig. 39.



Cysts are chiefly found in the ovary and broad ligament; they are not painful on pressure, and do not prolapse into the cul-de-sac, as does an enlarged ovary. By passing the finger into the rectum we are generally able to detect their true character. A pedunculated fibroid is very dense, and is not sensitive to the touch. When the pedicle is long enough to admit of the usual freedom of motion, the tumor will seldom be found twice in the same position, and will, in turn, displace the uterus backward or forward.

At an early stage of the digital examination, it is of great importance to form an accurate opinion as to the mobility of the uterus, not only as to its connection with a neighboring growth, but equally in the absence of any such body. If we are able to appreciate, by means of the finger, that the uterus is not as movable as it should be, we must proceed in the examination with great care, under the supposition that there has been inflammation of the connective, or cellular, tissue about the uterus; and while it is necessary to ascertain its character and extent, the examination must not be conducted roughly, as it might result in bringing on an acute attack.

When the uterus is found to be enlarged, we must make an attempt to ascertain the cause of the enlargement, for, until this has been accurately determined, we cannot institute the proper treatment. The presence of a mass in the pelvis or abdomen may be readily appreciated by the bimanual examination, but it may require a systematic investigation before it can be determined whether it consists of an enlarged uterus, an external growth involving the organ, or of one in its proximity. In view of the various possible conditions, we are to conduct the examination somewhat in the following order, not because it implies any relation to the frequency of occurrence of one or the other, but because it will enable us to exclude with certainty each successive condition, and so expedite our examination without detriment to the patient:—

1. Pregnancy.
2. Enlargement of the uterus, with cellulitis or hæmatocele.
3. Enlargement remaining after a miscarriage or childbirth.
4. Enlargement of the uterus from growths in its walls and within its cavity.
5. Congestive hypertrophy of the uterus in the unmarried or sterile.
6. Ovarian tumors, extra-uterine pregnancy, and other growths in proximity to the uterus. The previous history of the case will generally be an important guide to the condition, but cannot be relied upon exclusively.

When we have ascertained from the patient that the menstrual flow has been absent for several months, the natural inference is that pregnancy exists, but the length of time since the disappearance of the flow should bear some relation to the size of the uterus at the time of the examination. Pregnancy may be suspected, but we have no sure and lawful means of proving its existence before quickening, when the enlarged uterus rises from the pelvis into the abdominal cavity. When this has occurred, the motion of the child may be felt, and the beating of the fœtal heart detected, which must be accepted as conclusive evidence. The uterus will be then found softer and more uniform in shape than when enlarged from a fibrous tumor in its wall. The history of the case, should a fibrous tumor be present, would also show the previous existence of hemorrhages for a longer period than that during which pregnancy could have existed. It would be, therefore, in the early months of pregnancy that the chief difficulty in making a diagnosis would be experienced. All the early symptoms of pregnancy may also result from enlargement of the uterus from other causes, and a "show" may occur, with some regularity, for several months after pregnancy has taken place, from an erosion at the neck. We are, therefore, always to be on the lookout for such a complication, and when in doubt, it is better to wait a few months until the true condition can be established without risk of injury to the patient. To bring about an abortion by our own carelessness in the mode of examination, is quite as culpable as when done with criminal intent. The condition must be very rare indeed in which some evidence would not be present to lead us to suspect the possible existence of pregnancy, were we to conduct the investigation properly. I have frequently had women consult me, giving fictitious statements of their cases, and when I had concluded the examination, merely a digital one, they have expressed their surprise that I had not passed the sound. They have candidly acknowledged that they had known of their pregnancy, and came to be examined, thinking, that as I was accustomed to the introduction of the sound, it would be passed without injury to them, but would be the means of producing an abortion. We are, therefore, to be continually on guard, as a matter of conscience, for our own protection, and in the interest of the patient, who may not be aware of her situation; for the occurrence of an abortion would, in all probability, seriously complicate her condition.

Inflammation, more or less in extent, of the cellular tissue about the uterus, is of very frequent occurrence, and it may become so blended with the organ as to make it difficult to judge of the exact condition of the uterus itself. The history of the case will not always lead us to suspect the complication previous to making the examination. If a recent attack has occurred, the finger will detect a hard, unyielding, flat surface stretched across the roof of the pelvis, which will be painful on pressure, and cannot well be mistaken for any other condition. Although the uterus will always be somewhat enlarged from the inflammation obstructing the circulation of blood, we will find, by the aid of the hand over the abdomen, that the length of the uterus bears no proportion to the size of the mass as indicated by the finger in the vagina. To be able to detect and appreciate the stage, as well as the extent, of this always somewhat serious complication is very important, since, without proper care in conducting the examination, a fresh attack may be brought on.

Hemorrhage sometimes occurs in the pelvis about the uterus, forming a hæmatocele which it may be difficult to distinguish from the cellulitis that frequently accompanies it. But the history of the case will generally indicate the suddenness of the attack, coming on, as a rule, about the time of the menstrual period, and accompanied by prostration and other symptoms indicative of a loss of blood. If recently formed, the tumor will be felt softer than when cellulitis has occurred alone; its shape will also be different. Some depression can always be detected by the finger between the mass and the uterus, as if two rounded surfaces were lying in contact. The blood begins to accumulate first in the posterior cul-de-sac, as the lowest point to which it gravitates, and acquires the rounded outline of the cavity, which never occurs with cellulitis. Again, when the collection is extensive, the hand placed over the abdomen, with the finger in the vagina, will detect the mass extending off to one side in a flattened form, above the point for cellulitis, and it cannot be mistaken for the uterus. In this condition, we must also exercise great delicacy of touch, and leave the position of the uterus undisturbed for fear of reproducing the hemorrhage.

After a miscarriage or childbirth the uterus may remain too large, from imperfect involution. The organ will generally be found movable, free from adhesions, and uniformly hypertrophied throughout. The neck will frequently be found lacerated and covered with an extensive erosion, and the uterine canal open, and with a profuse leucorrhœa. The history of the case will likely indicate the existence of some difficulty following a previous pregnancy, after which menstruation became either scanty or too free, and, as a rule, more painful. The true condition will be easily recognized, and the most important point will be to establish the cause of the non-involution, with the view of instituting the proper treatment. We will find the chief causes of non-involution to be laceration of the neck, cellulitis, displacement of the uterus from laceration of the perineum, and prolapse of the vaginal walls, with impairment of the general health.

A fibrous tumor should never be mistaken for pregnancy, since the record of the case, with rare exceptions, will show the frequent and irregular occurrence of hemorrhage during a long period of time. If large enough to occupy any portion of the abdomen, its surface will be found hard and irregular, or nodulated. Occasionally, we may meet with a case of fibrous tumor where a long interval occurs without even a menstrual show, with the possibility of pregnancy existing. Under these circumstances we must have all doubt as to the condition removed before we make any attempt to reach the interior of the organ. When a growth is being developed within the uterine canal, or nearer that surface than the outer one, the organ may be uniform in shape, and we will be unable to arrive at any definite knowledge until the canal can be dilated by a sponge tent sufficiently for the introduction of the finger.

The body of the uterus is frequently found enlarged, from some obstruction to the circulation, in females who have never been pregnant. Some degree of flexure above the vaginal junction often exists in these cases, and likely the remains of a previous attack of cellulitis will be detected. The same condition is found with women who have been in the habit of taking means to prevent conception, or when sexual intercourse has not been properly performed, from incapacity on the part of the male, or wherever the laws of nature have been violated.

Without a knowledge of the previous history of the case, an ovarian cyst or tumor may be mistaken for pregnancy. But its growth is generally of much longer duration than the term of pregnancy. Menstruation, as a rule, undergoes but little change; fluctuation can be detected at some point in the mass, and, from the vagina, the uterus can generally be felt of a normal size, lying either backward or forward under the tumor. It is sometimes difficult, by means of palpation alone, to make a diagnosis between an ovarian cyst and a fibrocyst of the uterus, but in the latter condition the organ is generally found, on passing the probe, to be very much enlarged.

Extra-uterine pregnancy fortunately is of rare occurrence, and its existence is seldom suspected until rupture of the sac takes place. The development is sometimes retarded beyond the usual term of gestation, which fact may lead to an examination, and we may not be able to detect the exact condition, since, if death of the fœtus has taken place, an attempt of nature will have been made to encyst the whole mass; but we will find the uterus, although somewhat enlarged, not involved in the mass, unless indirectly from the occurrence of cellulitis.

Abscesses in the cellular tissue of the pelvis, between the broad ligaments, and in the substance of the ovaries, may be mentioned. The history of each case will give evidence of constitutional disturbance from inflammation and the formation of pus, and it will not be difficult to establish the fact that the uterus itself is not involved.

Cancerous infiltration of the tissues of the pelvis, and deposits of the same character on the omentum, need only now be referred to, as it will be easy to ascertain their relation with the uterus and other organs.

After obtaining all the information to be gained by a digital examination, we must note the size of the vagina; prolapse of either wall; thickening of the urethra; or tenderness in the neighborhood;

and whether there has been laceration of the perineum, and if so, the conditions resulting from it. There will be no need of an examination of the bladder unless some point in the history of the case should indicate the necessity.

But no examination is complete without passing the finger into the rectum, not only to confirm the impressions obtained by touch from the vagina, but also to ascertain the condition of the viscus itself. At the entrance, within a fold of the sphincter, an unsuspected fissure may be found, which, from reflex irritation, may cause irritability of the bladder, and disturbance of the circulation in the pelvis, leading to dysmenorrhœa, tenesmus, prolapse of the uterus, leucorrhœa, and congestion of the ovaries. All of these conditions I have been able to trace directly to the presence of a fissure in ano, and relief has followed its cure. A fissure is always accompanied with obstinate constipation, a condition which, if not relieved, at least temporarily, will, in consequence of the obstruction to the circulation, greatly retard the recovery of almost every case of uterine disease. The presence of a rectal polypus will also cause a great deal of reflex irritation in the neighboring organs. But the great advantage of a digital examination through the rectum, is the facility it gives us to explore portions of the pelvis out of reach from the vagina. We can bring within range of the finger nearly the whole posterior wall of the uterus, if of normal size, and any enlargement of the ovary in this direction can be detected. The extent of a cellulitis can be fully mapped out, and we can judge of the nature of growths which may not even have been suspected from a vaginal examination.

The late Prof. Simon of Heidelberg has so far appreciated the advantage to be gained from a rectal examination, that he was in the habit of introducing the whole hand, and passing even beyond the sigmoid flexure. I have succeeded in passing my hand into the rectum several times, and without the slightest bad result, as the sphincter entirely regained its power in a few days; but I succeeded in gaining no further information than, nor even as much as, I could with one or two fingers alone, since, from the cramped position of the hand, there was no freedom of motion. To introduce the hand it is always necessary to administer an anæsthetic. If this is done I can, with two fingers, reach well up to the sigmoid flexure, and by conjoined manipulation make a still more thorough exploration of the pelvis. As the sigmoid flexure is so bound down I cannot divest myself of the conviction that it is dangerous to attempt to pass beyond it.

In addition to this mode of examination by the rectum, I will refer briefly to the recent practice of exploring the bladder and anterior wall of the uterus by introducing the finger through the urethra. Prof. Simon used a graduated series of dilators of conical shape, and recommended that the passage should be opened rapidly. I have used the dilators, and have also employed my finger alone for the purpose; I have brought about the dilatation rapidly, and I have accomplished it gradually, but always with great care. In my book on Vesico-vaginal Fistula, published in 1869, I deprecated the practice of dilating the urethra for the removal of stone, as I had met with cases where incontinence of urine remained afterwards. I have, however, met with cases where the urethra was dilated without the slightest difficulty, and with no incontinence afterwards. Again, I have been so unfortunate as to lacerate the neck of the bladder, in spite of all care, and without the slightest premonition. I have known the same accident to occur in the hands of others. For the present it is only necessary to state that, as a means of diagnosis, it does not compensate for the risk; by means of the conjoined manipulation, the anterior wall of the uterus can be quite as thoroughly examined from the vagina.

Without the use of the probe we cannot always be sure of the true direction of the uterine canal, nor of the relation of the organ itself to external growths. The instrument may be introduced while the patient is lying on the back, the finger being used as a guide to the os uteri. But I prefer to introduce it after bringing the cervix into view, although it may be frequently necessary to turn the patient again on the back. The mode of examination with the probe will be again referred to, after describing the manner of using the speculum.

After completing the rectal examination, if there is still a doubt as to the relation of some outgrowth to the uterus, Sims's elevator may be used, with the patient on the back, or we may defer its use until after the speculum examination. This instrument has already been described, and it will be found most useful for releasing, as it were, the uterus from a neighboring mass. The organ is placed so perfectly under control of the operator by its use, that, unless the uterus be so much enlarged as to admit of little freedom of motion, a very accurate estimate can be formed as to its attachments.

Mode of Using the Speculum.

Bringing into view the cervix and the greater portion of the vagina, by means of Sims's perineal retractor, or speculum, is effected not so much by the manner of holding the instrument, as by placing the patient in the proper position.

She is to lie on the left side obliquely across the table, with her lower limbs flexed, so that her head and knees will be near the edge of the table, to the right of the operator, and her hips near the lower angle on the opposite side. The under or left arm should be drawn out from under her, and flexed across the back, while the body must be rolled over on the chest as much as possible. This will necessitate the flexing of the upper, or right, leg, until the knee comes in contact with the table, and it is, therefore, drawn up more than the under one. In this position the face is partially turned to the right, and the head must be placed on a level lower than the pelvis, with only a small pillow under it. It is a good plan to have the legs at the head of the table about three inches shorter than those at the foot. It is very convenient to have a foot-board, which can be drawn out when needed, since this affords a resting-place for the feet and enables the hips to be placed at the edge of the table, within easy reach of the operator.

For an operation, or when some special examination is to be made, it is necessary that all the clothing should be made loose about the waist. When this has been done the vagina, on the introduction of the speculum, will become fully opened by atmospheric pressure and the action of gravity. But for an ordinary examination this preparation is not necessary, and when the cervix is not exposed at once, it can be brought readily into view by other means. That there may be no unnecessary exposure a sheet must be thrown over the patient by the nurse, so that one end may be tucked in between the legs to cover the upper buttock, and the lower one is to be covered by an extra napkin, which will also protect the patient's clothing.

As the nurse, with her left hand, draws up the soft parts and right labium, the operator is to introduce the instrument, well lubricated and guarded by his index finger, which must occupy the length of the vaginal portion of the speculum. After the speculum has been directed into the hollow of the sacrum, the soft parts are to be firmly pressed back, by the thumb and index finger against the instrument, which is to be thus held until it can be grasped by the assistant. If the speculum be held properly, it not only retracts the perineum, but it also helps to elevate the upper labium. The instrument is not to draw back the perineum in a line with the coccyx, but to make traction to the right of it, and somewhat obliquely across the upper buttock. By placing the buttocks close to the angle of the table, the assistant is enabled to stand sufficiently behind the patient to steady the instrument. This is not to be done by traction, but by using the width of the hand, placed as a wedge between the buttock and upper edge of the speculum. The central portion of the instrument lies against the flat of the hand, and the upper part in the sulcus between the thumb and index finger, so that the fingers are free, and can be moved without disturbing the position of the speculum. By thus using the hand as a wedge, the instrument can be steadily held in place for hours, during a long operation, without cramping the fingers. It adds greatly to the comfort of a patient to have the instrument held in this manner, and she is unable to relax herself so long as the perineum and rectum are being irritated by the frequent jerking which occurs when traction is made by the fingers alone, without a resting-place for the hand, as I have described.

Unless each article of clothing about the waist has been loosened, the uterus will not always be brought into view on opening the vagina with the speculum, and even then it is often necessary to push aside the anterior wall with the depressor. When the cervix is once exposed, it will generally remain in view by drawing it gently, with a tenaculum, in front of the fold which has been depressed.

We are now to examine carefully the condition of the mucous membrane of the vagina and the cervix. From the appearance and quantity of the discharge we may form some idea of the extent and location of disease within the uterine canal. The more profuse the secretion, the more certain we may be that its source is below the internal os, and from the cervical portion of the canal. In every instance where the female has had an abortion produced or borne a child, the cervix must be carefully examined for a laceration of some form, as lacerations are the most common cause of hypertrophy of the uterus. If an erosion exists, it will probably be a partially healed laceration, and must not be mistaken for what is commonly termed "ulceration:" it is but an excoriation, caused by the uterine secretions flowing over the parts.

When in doubt, after a digital examination, as to the direction of the uterine canal, the true condition can be ascertained only by means of the uterine probe. This instrument should be given a curve in accordance with the supposed direction of the uterus, and, as the cervix is being steadied by means of a tenaculum, it can be introduced into the canal. If resistance to its passage is met with, we can judge, at least, if the general direction be correct, although some change in the curve may be needed. The probe can be withdrawn to make the change deemed necessary, and this should be done until it can be easily passed to the fundus. This will enable us to appreciate the exact direction and depth of the canal. This instrument enables us to gain the needed information without doing harm to the patient. If we wish to obtain its fullest benefit, it is to be handled simply as a probe, being introduced always with care and great delicacy of touch. It is to be passed with as light a hand as a surgeon would employ in probing the track of a gunshot wound, that we may be able to detect changes in the diameter and other details of the surface of the canal. In fact, we must feel with it as if the instrument were a prolongation of the index finger, and if pain or bleeding is caused by its use, under ordinary circumstances, the result must be attributed to faulty manipulation. A Simpson's sound is of no value in my hands for any purpose, and I have for many years abandoned it as a dangerous instrument. This will, doubtless, be regarded as an exaggeration by many who think it useful; but let any one, not biased, train himself to use the probe, and he will be fully compensated, in finding a new method of observation open to him. When the uterus is very much anteverted or flexed, it is often difficult to pass the probe, and it will be necessary to give it two curves, one of which must be quite large, for the perineum would be in the way were we to attempt to introduce the instrument without it. When we are obliged to pass the probe through a tortuous canal, it is often necessary, after advancing a certain distance, to turn the patient on the back without removing the instrument. Then while directing it with one hand, we can change its curve, from time to time, by pressing it in the proper direction, against the side of the vagina or cervix, with the index finger of the other hand.

There are two conditions always to be borne in mind when we are about to pass the probe, and, although they have already been referred to, the importance of the precaution warrants their repetition; "be satisfied beforehand that neither pregnancy nor cellulitis exists." As to the first of these conditions, we may be in doubt, and must, therefore, defer the examination until such doubt is removed; but to overlook the existence of cellulitis is culpable. When there has been a recent attack of cellulitis, or if tenderness on pressure still exists in the neighborhood, the instrument should not be introduced. Again, with the finger, we may be able to detect the products of inflammation remaining in the forms of thickening, but without tenderness ; in such cases the probe may be used with care, but we must scrupulously avoid disturbing the position of the uterus.

Many a poor woman has had to suffer from the carelessness of her physician in overlooking a latent cellulitis, and endured years of bad health, and often permanent sterility, from this disease being rekindled by the unskillful use of the probe or sound, and extending beyond the limits of the first attack.

CHAPTER V.

CAUSES OF DISEASE, REFLEX AND DIRECT.

Influence of ganglionic or sympathetic system of nerves—Faulty nutrition—Uterine congestion and inflammation—Effect of increased weight of the uterus—Influence of the ovaries upon the uterine condition—Sub-involution—Constipation—Influence of fruitfulness and sterility upon growths—Difference between a fibroid and a fibrous tumor—Active exercise renders the uterus less liable to conditions arising from celibacy—Cancer and corroding ulcer—Atrophy of uterine body—*Accidental causes of disease*: 1. Products of inflammation and hemorrhage—2. Injuries of the cervix and displacements—3. Injuries of the vagina and its outlet—4. Results of inflammation of mucous glands of the vagina, uterus, Fallopian tubes, and ovaries.

DURING childhood, the female organs of generation are, as a rule, exempt from disease. But from constitutional causes, from exposure or accident, inflammation of the mucous membrane of the vagina and outlet sometimes occurs. In rare instances, tumors of the ovary and uterus are developed before puberty as a consequence of perverted nutrition.

The exciting causes of disease during the developing stage of puberty are hereditary or acquired fulness of body, causing absence or arrest of local development, and disorders of the nervous system from impaired general nutrition. The diseases of married life are to be traced chiefly to the consequences of sterility and to the accidents of child-bearing.

During the natural change of life, and at the cessatiom of menstruation, disorders of the nervous system are very common, reacting on organic life until harmony of function is restored, or until the disturbing influences of new growths, due to perverted nutrition, shall have passed away. Finally, when all ovarian activity has ceased, and atrophy has taken place, the organs of generation become quiescent, and, as in childhood, are only liable to diseases of the mucous membrane from ordinary causes.

The sympathetic, or ganglionic, nervous system is the regulator of organic life, and the great source of nerve force by which harmony of action is preserved after the motor power and sentient life have been perfected. When in perfect action we have health, when impaired disease, and when its function ceases death results. It is sufficient for our present purpose to note its close relation with the function of nutrition. We see its connection with the circulation of the blood to such a degree that, to the smallest capillary, the vessels are covered with a network of its nerve filaments communicating directly with the common centres. This nerve force unquestionably excites the heart to action and the arteries to contract, but it is doubtful if the heart has the power to drive the blood through the capillaries, except by direct local stimulation of these nerve filaments by a healthy condition of the blood itself. With impaired nutrition, the blood will be deficient in the elements essential to this stimulus, and, as a consequence, the circulation becomes sluggish, and the venous capillaries congested. Therefore, when a condition has been reached, which we are able to recognize as disease, we may assert that impaired nutrition, as the cause, and not as the effect, depreciates the nervous force, without the full expression of which, functional derangement naturally follows. Again, from some unknown cause, the necessary nerve force becomes insufficient for the requirements of organic life, and the nutritive functions are the first to suffer. Although nutrition is subordinate fully to the influence generated from the ganglionic centres, yet, by a law of mutual dependence, this nerve force cannot exercise a healthy co-operation so long as nutrition is defective. When this balance is lost, we have local disease established at the weakest point in the body, whenever, from other causes, the organ is unable to protect itself. It is with the effect we have chiefly to deal, since beyond a certain point we cannot go in our speculations as to the exciting cause of disease, for the mysteries of life, the commencement of disease and of death, must ever remain beyond the limits of our appreciation.

From our present want of accurate knowledge on many points of pathology, it has been found to be a difficult matter to form any classification of the diseases of women which would be free from objection.

To illustrate my own views, I will assume for convenience that these diseases originate from causes to be attributed either to faulty nutrition or to accident.

The first classification, "from faulty nutrition," may be subdivided into congenital and acquired causes. Under the head of congenital causes we may place an inherited feeble organization, arrest of growth and absence of development before puberty, since, doubtless, these do tend to render the female more liable to disease. The acquired causes of disease are to be traced directly to faulty nutrition from which the balance was lost, after puberty, between waste and repair, leading to organic and functional derangement. From this loss of balance we have disturbances in the circulation producing hypertrophy or atrophy of tissues already formed, or the development of new growths, as tumors and malignant diseases.

Diseases from accidental causes result chiefly from the various injuries of childbirth, or from inflammatory action.

The girl is liable to the consequences of a feeble organization inherited from her parents, unless she be surrounded before puberty by circumstances well fitted to remedy the defect. Fortunately she is more likely to inherit the general physical tendency of her father as well as his intellectual force, but, as to her sexual development, she will certainly be more liable to uterine disease if her mother has been a sufferer in that direction. There are many exceptions to the rule, however, influenced by the relative ages of the parents to each other, as well as by the age of the mother at parturition. The daughter, if the eldest child, is less liable to local difficulties than she would be if born after other children, when her mother's health may have already begun to suffer. The young girl with a feeble organization will, as a rule, menstruate for the first time at an early age, unless careful attention has been paid through childhood to the proper physical training. This precocious growth is commonly attended by undue nervous development, so that the female is almost certain to suffer at a later period of life from some derangement of the organs of generation, as the result of faulty nutrition.

An arrest of uterine growth may occur in embryo without reference to the development of the ovaries, so that the cornua uteri may remain separated, or the vagina absent or imperfectly developed. But when the ovaries have reached a certain degree of development, the further growth of the uterus becomes dependent on them. Therefore, without the proper ovarian influence, the uterus will remain under size, although in shape it may have been perfectly formed. The ovaries may have attained a stage of development permitting of ovulation, yet, from some defect of vitality in the perfect maturity of the ovules, the process does not offer the proper stimulus to the uterus, and arrest of growth may take place at any time short of the full development of the organ.

Defects in development may be illustrated by the existence of a

Causes of Disease in the Female Organs of Generation.

- **Faulty Nutrition.**
  - **Congenital—previous to puberty.**
    - Absence of development in the vagina, uterus, or ovaries.
    - Defects in development, as double vagina and uterus, cleft of the urethra or recto-vaginal septum, want of proper development in the vagina as to shape, formation of flexures of the cervix.
    - Arrest of growth in the organism, partial development of the uterus or ovaries, separate cornua of the uterus.
    - An inherited feeble organization rendering the female liable to disease in after life.
  - **Acquired—after puberty—from a loss of balance between waste and repair, leading to organic or functional disturbance.**
    - Nervous disorders and reflex functional disturbance.
    - Development of new growth, as tumors of the uterus and malignant disease, from perverted nutrition.
    - Derangement in the circulation producing hypertrophy or atrophy of tissues already formed. Displacements and flexures of the uterine body.
- **Accidental and Inflammatory.**
  - Injuries after child-birth, as vaginal fistulæ and inversion of the uterus.
  - Cellulitis, pelvic peritonitis, and products; hæmatocele, ovaritis, prolapse of the ovary, and growths external [illegible] the uterus, obstructing the circulation, either from inflammation, or by acting mechanically.
  - Formation of cicatricial tissue; induration of the cervix.
  - From violence.
    - Producing retroversion.
  - Mechanically.
    - After laceration of the cervix.
    - By closure of the os uteri.
    - Laceration of the perineum, and consequences.
  - Inflammation of the mucus follicles of the cervix, vagina, and outlet of Fallopian tubes.

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    - An inherited feeble organization rendering the female liable to disease in after life.
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    - Nervous disorders and reflex functional disturbance.
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- ACCIDENTAL AND INFLAMMATORY.
  - Injuries after childbirth, as vaginal fistulæ and inversion of the uterus.
  - Cellulitis, pelvic peritonitis, and products; hæmatocele, ovaritis, prolapse of the ovary, and growths external to the uterus, obstructing the circulation, either from inflammation, or by acting mechanically.
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double uterus and a double vagina, a double uterus with a single vagina, or a single uterus with a double vagina. The vagina may be divided by a fissure extending partially or entirely through its length, or an impervious septum may exist, as I have seen, across its diameter, forming with the hymen two closed cavities. There may also be a cleft of the whole urethra, of which I have seen but one case, and of the recto-vaginal septum with absence of the perineum, a defect in development not infrequently found. I may also mention a common defect in shape of the vagina, the importance of which is not fully recognized: it is where the posterior cul-de-sac is absent, causing retroversion and subsequent flexure. An undue development in length of the cervix uteri at the expense of its width, is a common defect, from which either retroversion or a flexure of the uterine neck at the vaginal junction may take place. The defect in the shape of the vagina, and the misdirected development of the cervix are always found in connection with impaired nutrition, induced by the over-taxing or misapplying of the nerve force. Either condition may be found in the young girl who has broken down, after having succeeded in completing her education, at a time when nature was making every effort to perfect the growth of the organs of generation. Such a perversion of nerve force—this building up of a brain out of season—will always entail a defect of sexual development. Whenever a young girl, during the developing period of puberty, or previous to its completion, has been burdened with care or responsibility, or whenever her nervous system has been over-taxed from any other cause, and at the expense of nutrition, there will always result some such perverted or arrested development. There is often an arrest of growth in the ovaries and uterus, as well as defects in their development, and nature enters many a protest before she ceases from her efforts to repair the injury. I have known many girls who commenced their menstrual life free from pain, and in good health, and did not suffer until after they had begun to impair their nervous system by over-study. A physical examination in these cases enabled me to detect a condition of flexure of the cervix, causing a dysmenorrhœa, which could not have existed at the beginning, as the menstrual flow was then free from pain.

In regard to absence of development, that of the vagina is the one most commonly found. It has been questioned if the uterus is ever entirely wanting, authorities holding that one if not both cornua always exist, at least in a rudimentary form. But I have met with a number of instances where it was impossible, by any means of exploration, to detect the slightest evidence of the existence of the uterus in any form, and in these cases the vagina was always absent. I have never met with an instance where I could satisfy myself that the ovaries were wanting, since the general physical condition always indicated at least their partial development.

The effect of faulty nutrition, acquired after puberty from a loss of balance between waste and repair, will, to a great extent, occupy our attention as the chief factor, or exciting cause of disease. Under the first head we will consider the effects of derangement in the circulation, producing hypertrophy or atrophy of tissues already formed, with displacements and flexures of the uterine body.

Congestion produces fulness and expansion of the tissues, and this condition of the circulation may remain passive or result in inflammation, while a want of nutrition, from lessening the supply of blood, causes atrophy. Arterial congestion, the result of some local irritation, is a condition always temporary in duration when the reparative powers are in a state of integrity. Congestion, however, does not imply inflammation, although the latter cannot have a beginning without it. If the arterial congestion reaches a degree sufficient to establish inflammation, there will be instituted a distinct train of symptoms, consequent upon and secondary to the primary condition. It is necessary at the outset to appreciate the marked difference between passive congestion, which is generally venous, and inflammation. These terms are usually regarded as synonymous, but erroneously so, as are many in connection with uterine disease. Inflammation cannot exist without molecular death, and its products are easily recognized until absorbed. We may look in vain, after death, for any evidence of an existing endometritis, so called, or for an ulceration of the cervix, as it is termed, for neither of these conditions is inflammatory. We always find the tissues blanched, the blood from the capillaries having passed into the larger vessels, as the heart failed in keeping up the supply, and there will be detected neither loss of tissue on the surface of the mucous membrane beyond the epithelium, if even to that extent, nor any hyperplasm in the organ itself. Inflammation can exist only in an acute form, although its products may remain for an indefinite period. Therefore, the term chronic inflammation is a misnomer, and only serves to give erroneous impressions of the pathology and treatment of uterine disease. Inflammation of the uterine body never occurs except after parturition, and those conditions which are commonly held to be the direct results of inflammation are due wholly to obstructed circulation in the organ, caused by pathological processes in the cervix and neighboring parts. In this way are to be accounted for the so-called uterine hyperplasias with their attendant leucorrhœa.

The uterus, being an erectile organ, and surrounded by a mass of bloodvessels passing in every direction through the loose connective tissue of the pelvis, is directly affected by any increase or diminution in the neighboring circulation. We must appreciate the fact that in no other part of the body have we such a network of vessels within the same space. In consequence of the erectile character of all the tissues, these vessels in time become varicose, or over-distended, from any continued obstruction to the circulation, and have an almost incredible venous capacity. As a stream will saturate the ground and lose itself in a marsh, so will the circulation through the pelvic cellular tissue, and in diseased condition, become equally sluggish. The resemblance is a closer one than would be indicated by a metaphor. For, in attempting, after death, to fill by injection the vessels in the pelvis of a female who has long suffered from uterine disease, it will be found that the distinctive form of the veins is frequently lost at different points, and, with all care, the injections will become extravasated and diffused. With due allowance for the supposition that rupture would likely occur from an injection, when extravasation would not take place during life, it is proved that these veins become gradually stretched at different points out of all form, and become mere receptacles. In this over-distended condition of the veins, the contractility has been lost from impaired nutrition, and they are no longer able to return to the general circulation the same quantity of blood received by them from the arterial capillaries.

The uterus must settle lower in the pelvis from any increase in weight and from traction, and, in consequence of the prolapse, the difficulty will be augmented, since the veins are more easily compressed than the arteries. Should the obstruction continue to increase the prolapse, the uterus will become retroverted on reaching a given point in the vagina, by sliding forward in the direction of the vaginal outlet. This will occur, although the uterus may have been anteverted in the beginning. When the obstruction has been confined to one side, so as not to cause general enlargement, the organ will become flexed upon the comparatively healthy side, but when the obstruction is limited more to the fundus (and it is the more common form), the flexure will be on the diseased side. As soon as the weight of the flexed uterus causes it to settle in the pelvis, the circulation becomes still more obstructed, with the same consequences as attend congestive hypertrophy alone. An anteflexure of the uterine body may exist, and, if the organ should become heavy enough to reach the proper point in the pelvis, the uterus will be retroverted, and even this version changed into a retroflexion.

The simplest form of congestive hypertrophy may be illustrated by the condition sometimes found in a woman who has never been impregnated, where it exists as if it were a protest on the part of nature, the true function of the uterus never having been fully called into play. Few unmarried women reach the age of thirty-five without suffering more or less from this condition whenever the function of nutrition becomes impaired from the nervous disturbance which is likely to be the earliest manifestation. If nutrition improves, this condition disappears, and the system becomes reconciled, as it were, to the state of celibacy. When this equilibrium is not established, some permanent uterine disease is likely to be set up, generally in the form of a fibrous tumor.

We meet with congestive hypertrophy accompanying sterility, which is also a protest of nature. This condition will be found whenever the laws of nature have been persistently violated, by means taken to prevent conception, or where the act of intercourse has been improperly performed. The common cause is the use of the condom or other means by which the semen is excluded from the vagina, since its presence is doubtless the natural stimulus for relieving the congestion of the female organs of generation. Congestive hypertrophy also occurs in the female who has been the victim of an ill-assorted marriage, in prostitutes, and possibly in those addicted to self-abuse. Yet I must record the result of a large experience, to the credit of the sex, by stating that I have never met with a case of self-abuse in the adult woman, which could not be traced to disease as the cause and not the effect. I have met with instances of congestive hypertrophy due, I thought, simply to the fact that the female was a wife without the healthy influence of having been a mother. In these cases no cause could be detected for the sterility, and which, therefore, inferentially, could only be due to some defect in development, or to obstruction in the Fallopian tubes. The condition of the Fallopian tubes of course could not be determined, but ovulation certainly took place. In the absence of any positive knowledge, it was supposed that the process of ovulation in these cases was so far wanting in vitality as to fail, not only in rendering conception possible, but even in generating the healthy ovarian influence.

Some may claim that the existence of passive congestive hypertrophy of the uterus is due and secondary to some abnormal condition in the ovaries. The ovaries, except during pregnancy, exercise, unquestionably, a very important influence upon the uterus throughout the sexual life of the female, without which it cannot fully perform its function. Yet hypertrophy of the uterus is often found to exist long before any abnormal condition of the ovaries can be detected. Ultimately, however, if the hypertrophy continues, disturbance in one or both ovaries will become manifested by pain and enlargement, and even prolapse may ensue, a result secondary to the uterine condition, so far as we have any means of judging between cause and effect. These facts, and others derived from a long and close study of such cases, lead me to believe that the uterine nutrition and function cannot be dependent solely on the influence of the ovaries. The ovaries are able, doubtless, to perform their function in the absence of the uterus, while the converse is impossible, and thus the subordinate relation of the uterus to the ovaries is shown. Both are dependent for their nerve force on the solar plexus, in common with all the organs of the body, but I believe the view which has been advanced by some observer will be found correct, that they are both under the influence of a special ganglion. If this be true, with a mutual dependence, under certain circumstances, on each other, but both subordinate to a common governing influence, a morbid condition may exist separately in either the ovaries or uterus without necessarily involving the other.

The condition termed sub-involution, where the uterus remains too large after childbirth, is one due to faulty nutrition, the reparative powers having been checked in the process of removing the old material. The weight of the uterus acts as an additional source of irritation, as soon as the female attempts to exercise, and we have the hypertrophy increased by passive congestion. There are many of these cases where the arrest of repair might be traced to the enfeebled general condition of the female, and due, therefore, strictly to faulty nutrition. But in my experience the number from this cause is by no means so great as generally supposed, since the faulty nutrition is often the effect and not the cause. This will be treated of at greater length under the head of accidental causes, where the arrest of involution is considered due to the mechanical effect resulting from laceration of the cervix, and displacement of the uterus, in consequence of laceration of the perineum.

I have frequently met with congestive hypertrophy among females who had lived in some of the malarial districts of the Southern States. This enlargement of the uterus remained as one of the sequelæ of repeated attacks of intermittent fever after the condition of the general system had become impaired. The venous congestion of the pelvis, with the enlargement of the uterus, was brought about after the vessels had lost their tone, from the frequent backing up and obstruction to the return circulation through the portal system.

Habitual constipation and errors in dress, causing obstruction to the venous circulation of the pelvis, will be found in practice to be frequent causes of congestive hypertrophy of the uterus. The obstruction to the circulation is at first purely a mechanical one, but at length the coats of the vessels lose their tone, and, having become habitually over-stretched, the difficulty is likely to remain long after the cause is removed.

We will consider briefly the development of new growths as the result of acquired faulty nutrition, due to the loss of balance between the waste and repair. So long as the uterus is kept properly occupied with its legitimate function, this balance is rarely lost. The female who has passed her life in a state of celibacy is more liable, after the age of thirty, to suffer from the development of a fibrous tumor than the sterile, or the woman who has borne children, while the sterile is more liable than the fruitful woman. At the same time, the female who has borne children is not exempt from these growths, but she generally suffers, as a rule, after she has been rendered sterile from some other cause.

It is necessary to make an explanation of the difference between a fibroid and a fibrous tumor. A single or isolated fibroid may become established in the uterine wall of a sterile woman, acting mechanically as the cause of her sterility, or her sterile condition may have resulted from some other cause. But from the fact of her being a wife, such a growth will be held somewhat in check. The unmarried woman, however, leading a life contrary to the design of nature, can have no outlet for the nerve force which is being constantly directed to her uterus. She may have a fibroid developed because she has never been impregnated, but without the advantage of the sterile woman, with whom the superfluous nerve force may be partially spent in sexual intercourse. Therefore, in the unmarried female the whole force of this state of perverted nutrition is directed to the growth of a fibrous tumor, which we may consider, for our purpose, to consist of many fibroids.

When the unmarried female, from necessity or inclination, has had her nervous energies somewhat expended through other channels, in a steady occupation of mind or body, the uterus is less liable to suffer from the state of celibacy. Thus the servant girl, when well fed and protected from the effects of exposure, is far less liable to suffer from the development of a fibrous tumor, or from a fibroid, than the female who passes her life under circumstances better fitted for the generation of nervous force, but without proper means for its expenditure.

The woman who has passed through the period of sexual life in perfect health, with all her superfluous nerve force fully absorbed in the legitimate channel of childbearing, is more liable to suffer from perverted nutrition in the development of some form of malignant disease, when a change of life takes place. Sarcoma may occur at any time during the active sexual life of a female, and, with but one or two exceptions, in the few cases I have met with, this condition had been preceded by the presence of a fibroid. In these cases the disease has occupied the locality of the tumor, and has originated, apparently, from some change taking place, as the result of perverted nutrition in the tumor itself. This disease is rarely found in the female who has borne children; at least I have never met with it except in the unmarried and sterile. Epithelioma, on the contrary, is a condition found developed in the woman who has been unusually healthy, and, as a rule, who has given birth to a number of children beyond the average. I find from my note-books that in private practice I have never seen an instance of this disease in the sterile or unmarried female. All had been impregnated and borne children to full time, except two who had suffered from criminal abortion early in life, and were sterile afterwards. In public hospital practice, however, I find recorded the histories of several females suffering from this disease, who claimed to have been unmarried, and consequently would have denied a pregnancy. As there existed no object to deceive among the class of cases treated in private practice, it may be accepted as a fact that epithelioma is rarely, if ever, found in the female who has never been impregnated. Epithelioma and corroding ulcer are, as a rule, developed rather late in life—the latter generally before the natural cessation of menstruation, and the former after it has ceased. I have never met with a case of corroding ulcer before the age of thirty-five, but epithelioma I have seen, as an exception, as early in life as the age of twenty-three. From studying the histories of these cases I am impressed with the belief that the exciting cause may some day be traced to a local irritation, set up in consequence of injury resulting from childbirth, most likely from laceration of the cervix.

Atrophy of the uterine body and cervix begins to take place as soon as the ovarian influence is no longer emitted, *i. e.*, when the ovaries cease to perform their function. It is then, as we have already shown, that the influence of the sympathetic system, which has been secondary since puberty, begins again to be the governing power. When a change of life has been brought about under healthy influence, the nutritive instinct, as it were, is gradually diverted to other points of the body, and manifests its decadence in any part from which diverted in the form of fatty degeneration of its tissues. Consequently, nutrition, when properly directed in the uterus, is occupied no longer in the formation of new structure, but only in the removal of old material. It is then possible that nutrition may be misdirected in its attempt to remove the products of some previous injury, and the development of a neoplasm is excited, in the nature of epithelioma. As atrophy of the uterus is brought about, the amount of blood distributed to its tissues is greatly decreased, but that going to the mucous membrane itself, which is still to preserve, in some degree, its function, is increased for a time. The mucous follicles, or glands, gradually undergo cystic degeneration, and in turn become atrophied, or they disappear, so that the mucous membrane is at length greatly changed in character, by comparison with its former condition. Epithelioma is a growth which springs from the mucous membrane, and is essentially one of perverted nutrition. Should the progress of this natural change in the mucous membrane be retarded or obstructed, as we have stated, by some injury which had been but partially repaired, it is not difficult to understand that this new growth might arise as a consequence of perverted nutrition. We acknowledge a marked difference between the development and progress of epithelioma and corroding ulcer. But both conditions, and even cancerous infiltration of the pelvic tissues, may have a common local origin or exciting cause, with distinctive features afterwards determined by some accidental surrounding as yet beyond our appreciation.

A tendency to new growth in the uterine mucous membrane of those who have borne children increases as a woman approaches the period when the active life of the organ is to cease. Thus we find the occurrence of mucous polypi more frequent, and the formation of granulations or vegetations more common at this time of life.

The nervous disorders and the reflex functional disturbances of women, in consequence of local disease of the organs of generation, present a most important field for investigation. Our present knowledge enables us to recognize the general relation of cause and effect, but we are yet unable to explain the fact why, with apparently the same local condition, a very different train of nervous symptoms may result, not only in different individuals, but in the same person at different times. Even a comparatively slight local cause of irritation will frequently produce a marked disturbance of the brain or other portion of the nervous system. Again, the brain will react on the local condition to such an extent, that the influence of mental depression in some individuals over the progress of uterine disease is remarkable and quite evident.

In the female the ganglionic system is developed to a greater extent, both in the size of the ganglia and in distribution of the nerves, than in the male; consequently her tenacity of life, and power of long endurance, in resisting the effects of disease, are greater than in the other sex. But this peculiarity renders her the more liable to reflex disturbances from the ovarian or uterine disorder.

It has been shown that the ovarian influence, when normally exercised through the sympathetic system on nutrition, is a healthy stimulus to organic life; but when this stimulus has been impaired, or deflected as a consequence of local disease, we have at once some reflex functional disturbance elsewhere.

There are two great nerve centres which are the recipients, directly or indirectly, of all nervous irritation. The brain is the centre of the cerebro-spinal system, and the solar plexus, or abdominal brain, as it has been termed, is the centre of the ganglionic system. The spinal nerves enter the ganglia and convey back impressions to the spinal system, and through the latter they pass to the brain. As long as functional life is properly regulated, the ganglionic system is, as it were, a silent partner in the nervous circle, yet a busy one in maintaining nutrition. Each system, though complete in itself, is in close relation with the other, and the two, like the wheels of a watch, work harmoniously together only so long as each performs its proper function, and is undisturbed by extraneous agencies. Each system is in constant communication with the other, keeping up well-ordered and healthy action, and it is only in case of disorder that the sympathetic system asserts its potency for evil by transmitting the morbid impression through the spinal nerves to the brain. A recognition of the impression is at once returned from the brain to the special ganglion of the organ affected, and pain is expressed at the extremities of its spinal nerve.

In the lower classes of animals the ganglionic system is fully developed without reference to the condition of the brain. A morbid impression originating in the organs of generation would be transmitted to the solar plexus and to the spinal system, but without serious reflex disturbance to the brain itself. But in woman, as a higher type of development, the brain is made to participate more or less in every disturbance in the ovario-uterine circle, and she is frequently a sufferer even when its function is normally performed.

But when the brain has been rendered morbidly sensitive by faulty education, lack of moral training, or by some previous mental shock, the whole force of any disturbance in the organs of generation is thrown directly on the cerebro-spinal system. We then have manifested certain forms of headache, unusual wakefulness, and change in disposition. A female will become irritable in temper, or eccentric; various degrees of hysteria will be developed, and every grade of mental disturbance even to insanity itself. It is in the woman who has not been trained to a sufficient moral restraint, exercised through her own will or other agencies, that the more marked forms of hysteria are met with. A well-drawn distinction should be made between hysteria, which can be held under check by a healthy exercise of the will, and other nervous disturbances which are really beyond the control of the patient.

When the hysterical development reaches a certain stage, and then passes beyond the control of the woman, we have catalepsy, or a condition with symptoms resembling coma, resulting from disease of the brain itself. Under other circumstances, the morbid state of the brain, in sympathy with the spinal nerves, is expressed by loss of motion, or by simulation of diseases of the joints and spine. Again, reflex irritation may be manifested through the cerebro-spinal system by disturbed muscular action, in the twitching of some special muscle by chorea, or by a first attack of epilepsy. The more marked the disturbance in the cerebro-spinal system, the greater will be the probability that the first cause can be traced to some error in the mental and physical training of the child, by which nutrition has been perverted, or turned aside from its normal work. We find these manifestations common in the unfortunate woman who has had her brain developed and over-taxed at the expense of her organs of generation; in those who give themselves over to luxury and idleness; in the victims of sentiment and romance; and, in an aggravated form, in those in whom that sheet anchor of womanhood is lacking, viz., a devotion to duty and a healthy sense of moral obligation.

The woman who has been trained to hold her emotions under a proper degree of discipline, or in whom they have been held in check by a healthy occupation of body and mind, does not necessarily escape every degree of disturbance. But when trouble comes the effect is transient, and she escapes the unhealthy reaction of the disturbed brain on the local disease of the organs of generation, which is often a serious complication. She will be more liable to suffer from some reflex symptom traceable directly to the action of the solar plexus, or to experience some pain through the spinal nerves. Such pain may be expressed by tenderness on pressure at some point over the region of the spine, or in the organs of generation, about the lower portion of the abdomen and in the extremity. When the solar plexus is at fault the female suffers some degree of distress which cannot be better expressed than in the words of an Irish woman, as "a weakness entirely," which is a sudden feeling of depression coming on without any apparent cause. We find the stomach frequently sympathizing by reflex action, as evinced by nausea, and disturbances in digestion with dyspeptic headache. The action of the liver becomes deranged, the intestines are constantly distended by the accumulation of flatus, and occasionally there is diarrhœa. The regular action of the heart is often disturbed, and in fact there is no organ in the body which will not sympathize with an unhealthy condition of the female organs of generation; nor is there any portion of the body which may not, at some time, become the seat of neuralgia from the same cause.

Accidental Causes of Disease.

Under this head, in a general manner, have been grouped, 1st. What may be termed the products of inflammation, viz., those resulting from cellulitis alone, or those which follow the accumulation of blood in a hæmatocele situated in the neighborhood of the uterus, and which, by displacing the womb, or by obstructing the circulation, has led to inflammation of contiguous parts; 2d. Injuries of the cervix, and displacements of the uterus from violence; 3d. Injuries to the vagina and its outlet; 4th. The result of inflammation of the mucous glands of the vagina, uterus, or Fallopian tubes.

Of all accidental causes, inflammation of the cellular or connective tissue of the pelvis, and especially that between the folds of the broad ligaments, is the most common; and next in frequency may be placed pelvic peritonitis and hæmatocele. These conditions are of far more frequent occurrence than is generally supposed by the profession. Often they are not recognized when existing, and their products, to be found long after the original disease has passed away, are almost universally overlooked. Their mechanical effect is to displace the uterus and obstruct its circulation, causing congestive hypertrophy, and often seriously interfering with the function of the bladder and rectum, by pressure. After the original condition has subsided, thickening and contraction take place, which will continue to act as a mechanical source of irritation to the uterus, and to defeat every effort for relief until the true condition is fully appreciated. For instance, after an attack of inflammation, one of the broad ligaments will become shortened, so that one or both conditions, thickening and shortening, will be a cause of irritation. Either the whole weight of the uterus will be thrown on the shortened broad ligament, thus keeping up the cellulitis on that side, or the traction on the opposite ligament will be sufficient to excite inflammation in its neighborhood. In either condition, or if both exist, no local treatment directed to the uterus alone can reduce its size, nor can it remove a flexure or heal any erosion which may result from an attempt of the uterine vessels to relieve themselves of the effects of an obstructed circulation. The first step towards recovery will have been made as soon as the uterus has been lifted and held in a position in the pelvis in which this traction and the obstruction to the circulation will be relieved. The effect also, on the bladder and rectum, will be to remove the reflex irritation they send to the uterus, a source often overlooked in the confusion as to cause and effect. Later in this work, when treating of displacements, this important subject will be carefully considered.

Inflammation of the ovarian structure, in proportion to its extent, will act as a source of reflex irritation to the uterus, causing congestive hypertrophy, by obstructing its circulation, or inducing its retroversion.

Sloughing from continued pressure of the child's head on the vaginal walls during labor, resulting in fistulæ, or loss of tissue with subsequent contraction, will often displace the uterus, interfere with the circulation, and cause much irritation to the bladder and rectum. The same cause and injury to the uterus often result in atrophy of the organ with permanent cessation of menstruation, even in early womanhood.

Inversion of the uterus will impair the general condition by the continued loss of blood, and by the drain on the system from the excessive leucorrhœa, but this condition seldom occurs directly from violence.

Violence, as the result of rapid labor, or of labor prolonged until the parts have lost their natural elasticity, and instrumental delivery, acting mechanically, afterwards, as a source of irritation, may be enumerated as causes of lacerations of the cervix and of the perineum, partially or through the sphincter ani. It will be seen hereafter that laceration of the cervix becomes a most frequent cause of uterine disease, arresting involution, and afterwards mechanically, through the irritation established by the separation of the flaps. Hypertrophy of the uterus is kept up and increased by this source of irritation, and an intractable form of erosion is produced with an increased menstrual flow and an exhausting leucorrhœa in the intervals. As a consequence of laceration of the perineum, we have a prolapse of the vaginal wall from want of proper support; the uterus then becomes retroverted, and, in consequence of the obstruction to the circulation from its malposition, still further increases in size.

Direct violence, as from a fall, will frequently cause retroversion, especially if it should happen that the bladder is filled with urine at the time of the accident. This displacement of the uterus, in proportion to the degree, is always attended by some obstruction to the circulation, which increases the size of the organ, and, if cellulitis follows, in consequence of the injury, a flexure is frequently a result.

The most frequent effect of the formation of cicatricial tissue about the cervix, after inflammation or induration following the continued use of caustics or the nitrate of silver, is general nervous irritability, and neuralgia in different parts of the body. It is sufficient at present to direct attention to the fact that the cervix is covered with erectile tissue, and is therefore largely supplied with bloodvessels which are inclosed, as it were, in a network of nerves from the sympathetic system. An appreciation of its structure will fully explain the reflex irritation from which women so frequently suffer in connection with injuries and disease of the cervix.

Inflammation of the mucous membrane of the vagina, uterine canal, and Fallopian tubes, is caused by exposure to cold, by irritating discharges, violence, and specific poisons. From some unknown cause or connection vaginitis and inflammation of the membrane of the uterine canal, without involving the deeper tissues, will sometimes, as has occurred under my observation, suddenly cease as by metastasis, and be followed by an attack of cellulitis or peritonitis. Simple vaginitis, as a catarrhal affection or when caused by irritative uterine discharges, is of little consequence beyond the temporary disturbance. When the inflammation, however, has been produced by gonorrhœa, it is apt to involve the mucous membrane of the urethra, and may even cause cystitis, by an extension of the inflammation to the bladder.

According to the observations of Dr. Noeggerath of this city, the secretions from the urethra of a man who has a stricture, the result of gonorrhœa, are of a sufficiently irritative character to establish inflammation in the genital tract of the wife, its favorite locality being in the Fallopian tubes. As a result of this inflammation there will be blocking up and narrowing of these tubes, and this he regards as a common cause of sterility. The condition described I have frequently seen after death, but without any knowledge as to the cause, while I have never met with an instance presenting any symptoms by which I could recognize its existence during life.

Cystic disease of the mucous follicles is a condition brought about by long-continued inflammation of the cervix, and by the frequent use of nitrate of silver and other caustics. As an effect of inflammation, the submucous tissue is rendered dense and changed in character so that the supply of blood to the mucous glands is, in a great degree, cut off. Their outlets become closed and the glands are destroyed by undergoing cystic degeneration. When a number become involved the pressure exerted by them is often sufficient to destroy other glands in the neighborhood which may not have yet taken on the same condition. When this pressure is not relieved by puncture, the diseased condition is likely to become extensive ; the cysts gradually rupture from over-distension, their cavities contract, and eventually atrophy of the uterus follows the previous hypertrophy of the cervix. Atrophy of the uterus from this cause may take place early in life as the result of laceration of the cervix, or from any other cause by which inflammation is established, and I have frequently seen the cessation of menstruation, after this change, followed by the rapid development of phthisis.

CHAPTER VI.

PRINCIPLES OF GENERAL TREATMENT.

Confidence of the patient essential to success—Influence of the mind over disease—Anæmia—Method of improving digestion and nutrition—Influence of sunlight—Influence of diet, etc.: coffee, stimulants, anodynes—Habitual invalids—Dress—Hours for meals, etc.—Importance of details.

THERE are certain general principles applicable in the treatment of all forms of uterine disease without reference to special treatment. All forms of local disease of long standing are closely connected with faulty nutrition. Commonly there exists some impairment of the general health manifested by functional derangement with anæmia, and the local disease is kept up by a loss of tone in the pelvic vessels. Our means of treatment are to be directed chiefly with the view of improving nutrition, and giving tone to these bloodvessels in the pelvis. It is necessary for success that the patient should receive careful general as well as local treatment. Both are essential, and the physician who neglects either will be disappointed in his results.

There can be no restoration to health in either the local or general condition, so long as anæmia exists, since the blood has lost those elements by which organic life is properly stimulated. In a case of long standing we will scarcely find an organ in the body which is not suffering from functional derangement. The connection of one function with another, as we have seen, is so intimate in the organic circle of nutrition that the derangement of any one soon jeopardizes the integrity of the whole. The result will be enfeebled digestion, a sluggish portal circulation, and imperfect respiration. The blood is no longer oxygenized properly, and it is returned to the general circulation in a condition not unlike that of a cold-blooded animal. The kidneys are over-worked, and the skin is inactive; repair, to a certain extent, has ceased, and general waste is the rule. In addition, we often have combined in the same subject, the pernicious effects following the habitual use and abuse of alcohol in some form, anodynes, and coffee.

The first step in the treatment of every case is, if possible, to gain the patient's entire confidence. As the mind has so much influence over the body, she must be impressed with the certainty of her recovery if the physician can conscientiously anticipate such a result. But he should never commit himself by stating the time necessary for the patient to regain her health, since this must vary in each individual. The physician should never allow himself to be placed in a position where his truthfulness may be questioned by the patient. She will never forgive any attempt to deceive her by holding out false hopes, and when once her confidence has been shaken, but little further progress will be made in the treatment of her case. The patient is to be taught to keep her nervous manifestations under strict control, for it is a healthy discipline, and as she is to be encouraged and aided by her physician, this influence cannot be exercised if their relation be on too intimate a footing. He should be kind and forbearing, but just to himself in this respect, without a show of sympathy.

Whenever a patient has become addicted to the use of stimulants, anodynes, or coffee, an effort must be made at once, without a compromise, to break up the dependence upon either of these insidious poisons to the nervous system. Their indiscriminate use having, in the beginning, aided not a little in bringing about the general wreck, a continuance would but defeat the best devised efforts for a restoration. I have rarely met with an instance where the patient was so far reduced that this plan could not be carried out, and it is the one attended in the end with the least suffering. In private practice, at the house of a patient, this may be difficult to carry out. But in my private hospital, the case would be kept under a strict watch, since the most truthful person cannot be trusted when going through the ordeal of a recovery from the influence of either alcohol or opium. The profession has, indeed, much to answer for, since many a confirmed invalid has been brought to this condition from the continued use of stimulants, but more especially anodynes, ordered by the medical attendant. Rarely, indeed, is there a necessity for the repeated use of anodynes, except during some attack of inflammation, for some special purpose after a surgical operation, or to one suffering from the advanced stages of malignant disease. It is an easy method of practice, but an unwarrantable one, to inject a little morphine under the skin, or to administer the hydrate of chloral, to save annoyance or the proper investigation for every real or imaginary pain of a nervous woman. It has been my misfortune to see so much of the evil effects of this easily acquired habit, far more difficult to overcome than the original disease, that, for years past, I have abandoned the use of the hypodermic syringe. I rarely give opium in any form by the mouth, and only under the above stated conditions by enema.

This mode of administration does not disturb the digestion so much; a smaller dose, comparatively, will answer for a longer time, without necessitating an increase in quantity, while the method is one the least likely to be resorted to, except from necessity. In private practice the case becomes almost a hopeless one from the hour that the patient becomes dependent upon the use of an anodyne. There can be no improvement afterwards in the powers of nutrition, and the nervous symptoms are all increased, so as to mask the true condition. The woman becomes a sufferer from opium neuralgia, or, rather, its habitual use brings about such an impairment or prostration of all her vital forces, that the power of endurance is lost, and every uncomfortable feeling becomes intensified into pain. The only hope for the future is to cut off the supply, as I have stated, and the physician in private practice is fortunate, who can make the attempt with the support of her friends, in carrying out a course attended apparently with so much suffering and cruelty to the patient. It will be necessary to resort temporarily to the judicious use of the bromide of potassium, to give more nourishment, and to adopt means for improving the general condition.

Digestion can be aided at first but little by the use of medicines, and our chief dependence will be simple but nutritious food, small in bulk, and administered frequently and with regularity. As soon as possible, attention must be directed to bringing about of a healthy action of the skin, by the use of hot-air baths, general friction, and frequent exposure of the body to the direct action of sunlight.

Facilities for taking a Turkish bath are to be found in most of the cities, and in the country some substitute can be resorted to. The use of hot air answers better for a class of cases suffering from anæmia than the steam or Russian bath, which is best fitted for persons more robust. Exposure to the action of the hot air should not be prolonged, at first, beyond ten or fifteen minutes, which is generally long enough to cause the skin to perspire freely. The patient is to be then sponged off with water as cold as can be borne without producing a shock, thoroughly dried, and well rubbed from head to foot. She should afterwards get to bed as soon as possible, take some beef-tea or other nourishment, and rest an hour or two.

A hot-air bath can be extemporized by the patient lying at full length on a cane-bottomed sofa, or several chairs, with a number of spirit lamps placed beneath, on as many large plates, while the person and chairs are covered by blankets. I have often resorted to this plan when a patient could not be carried a distance to the public bath, and it answers very well. I direct two large blankets to be spread out on the floor, the row of chairs to be placed in the centre, with the spirit lamps under them. I first have the lamps lighted, and the ends of the blankets turned up over the chairs, until the air has been heated. It is, of course, necessary for the temperature of the room to be properly regulated beforehand, that the patient may be in no danger of contracting cold from exposure. She is then to be placed nude and at full length on these chairs or sofa, in a comfortable position, and provided with a pillow. The ends of the blankets placed under the chairs are to be turned up over her and covered with a third blanket, leaving only her face uncovered, so that she lies directly on the perforated cane bottom with her body exposed to the heated air from below. At first, it requires the exercise of a little faith on the part of the patient, as the position is not unlike being on a gridiron over a fire, but in fact the body is at too great a distance to be sensible of the flames below, and, if the lamps are properly placed, there will be no danger of setting fire to the blankets. As soon as the skin begins to act freely, the limbs, and then the body, in turn, can be sponged off, well dried and rubbed. This can be done without exposure of more than a portion of the body at a time, and each part can be covered with a dry blanket until the patient has cooled sufficiently to be placed in bed or to have her clothing put on. When she is strong enough to help herself, she may envelop her body in the top blanket, and step directly into a full-length bath, filled with water of a comfortable temperature, after which she may be dried and well rubbed. This bath may be repeated two or three times a week, or, when the patient is strong enough, it may be taken daily. With any improvement in the condition of the skin, and in a patient whose limbs are always cold to the knees, there will follow a relief through the circulation, to the overtaxed kidneys, the portal system, and, indirectly, digestion will be aided.

We may learn much from the practice of the hydropathists, who often succeed in restoring the general health and improving the local condition, after others have failed to accomplish as much by the use of tonics and other remedies, when the patient has been unable to assimilate her food properly. Their practice is to envelop, or "pack," the body in a wet sheet, using warm water, and then to cover the body with blankets until a free action of the skin is established. Then a bath follows, with friction afterwards, which is an excellent method of accomplishing the purpose, when the patient is able to take exercise.

The action of sunlight is beneficial in relieving the anæmia, by creating a tolerance of the stomach for the preparations of iron. The use of iron, in any form, and sunlight must go together, for, without the aid of the latter, ferruginous preparations are not properly absorbed by the stomach, and must act as irritants. It is a most difficult matter for women to carry out this important practice, it being essential that the whole body should be directly exposed to the rays of the sun. Those who need it the most are generally too feeble to be sent to establishments in the city fitted up for affording the necessary facilities, and, therefore, for a time at least, the invalid must utilize the sunlight in her own room. The best period of the day is an hour or two before noon. The patient can be placed in front of a window on a low lounge or sofa, covered with a blanket, so that she may protect herself from cold by covering the part of her body which at the time is not exposed to the sunlight. Unless the weather is very mild, and the room warm enough, it is safer that she should keep on her stockings, and, if solicitous for her complexion, her face can be protected with a veil, and her hands covered by gloves. If in cold weather, and the window should be near enough to the fire, she can lie on the floor with several blankets and a mattress under her, and with a screen she can be protected from drafts and from observation. So long as she is not likely to take cold from exposure, or to suffer from fatigue, she may remain lying in the sun for hours, and without exposing her whole body at any one time she may, in turn, bring every portion into the light. This mode of treatment is most satisfactory in its results, and would be perfect if we could at the same time combine with it the benefit of fresh air. For all the annoyances which must necessarily attend this practice, the patient will be fully compensated; but it must be persevered in for weeks, and sometimes for months. During the time of menstruation the patient may lie in the sun, with her clothing on, but should not run the risk of exposing her body to the cold. I have known two instances in which the period was suddenly arrested by this exposure, and while the effect was likely due to cold, it is possible that the sun may have sufficiently disturbed the circulation and brought about the arrest, by diverting an increased quantity of blood to the capillaries of the skin. As soon as the anæmia is lessened to some extent, and the condition of the blood improved, the capillary action will become more vigorous, and the power of both assimilation and elimination must increase. We can then do more by medicinal means to assist digestion, and the use of tonics and preparations of iron may be resumed.

There will be presented such a variety of symptoms due to derangement of the digestive organs, that the physician will have to exercise his judgment in each individual instance. It is a well-established fact that, so long as the tongue remains coated, and the bowels overloaded, little or nothing can be accomplished by the use of tonics. I am often impressed with the conviction that there is no error so frequently made in the treatment of these diseases as the neglect of brisk purgatives from time to time, in the form of some mercurial. Even those who are apparently in a most debilitated condition are benefited by such treatment, and, although the prostration, for the time, may be increased, it is more apparent than real, since reaction is generally prompt. It is a marvel that blood-poisoning is not the rule in these cases, when we consider the almost incredible accumulation which often takes place in the intestinal tract, and the vitiated character of the secretions. This degree of tolerance is a favorable feature in some respects, but until the accumulation has been removed, and the character of the secretions changed, there can be no improvement in the appetite. All means adopted to stimulate digestion—this condition remaining—must fail, and only add to the disturbance. By emptying the bowels thoroughly, and relieving the portal system, we accomplish much from the good effect on digestion, and, at the same time, remove the chief obstacle to the proper return of the venous blood from the pelvis, through the liver, into the general circulation.

Unless there exists some contra-indication, I generally adopt the following plan, as one of the first steps in the treatment of those who have long suffered as chronic invalids.

I direct half an ounce of inspissated ox-gall to be dissolved in a basin of warm water, and thrown into the colon by means of a Davidson syringe, while the patient is on her knees and elbows. The greater portion of this quantity of water can be introduced in this position if it be done slowly. By making firm pressure against the anus with a folded towel, the patient can be greatly aided in retaining the injection long enough for the ox-gall to act as a solvent. The patient, in all probability, will be much exhausted, nevertheless, after twelve hours, eight or ten grains of the mild chloride of mercury, one scruple of the bicarbonate of soda, and half a grain of ipecacuanha may be administered at bedtime by the mouth. The soda will have the effect of increasing the purgative action of the mercurial far beyond what would result from its use alone. Its action will not be excessive, nor will an additional purgative be required. It will be found that more food can now be borne, and digestion may be aided by the use of some bitter tonic infusion. After a few days, should the tongue continue to be coated, it is a good practice to administer a scruple or more of ipecacuanha, and after the stomach has become settled, to repeat the dose of calomel and soda.

The course I have pointed out is apparently a harsh one for a class of patients generally suffering from debility, yet it is almost always borne well, and in the end fully compensates for the temporary disturbance. Beyond question these cases are prostrated, and suffer from the condition which I have described, and cannot be relieved by mild means; but the impression made by the treatment above suggested is, as a new sensation, beneficial. Afterwards it may be necessary again to resort to the same purgative, or a blue pill, but with a little care it will be easy to regulate the bowels, and any tonic treatment will be followed by improvement in the general condition. Many of the mineral waters, with or without iron, may be found serviceable when taken before breakfast, for the purpose of acting on the bowels. The preparation long in use, and known as the Rigby mixture, answers well with many cases. It consists of an ounce or more of the sulphate of magnesia, dissolved in some seven ounces of water. The salt is converted into a bisulphate, and rendered more active by the addition of a drachm of dilute sulphuric acid. An ounce of the syrup of orange peel, with fifteen grains of the sulphate of iron, if needed, may be added, and from one to two tablespoonfuls in a little water is to be taken early in the morning. This combination is an excellent one, as it does not constipate after using it for any length of time, but may be from time to time left off and resumed again when needed. As with all saline purgatives, its action is rendered more prompt by some warm fluid, as a cup of tea, taken into the stomach shortly after the medicine has been administered. When the patient is unable to exercise, and there is a tendency to fecal accumulation, five grains of inspissated oxgall, made into a pill, may be given three times a day, with a small dose of rhubarb and soda every other night. The habit of regularity must be established, and if necessary, the use of a small enema of tepid water can be employed to bring about the action at a regular time. It is often necessary to combine strychnia, or some other preparation of nux vomica, with the various remedies used to regulate the bowels. This is done with the view of exciting and giving tone to the muscular tissue of the intestines which has become gradually overstretched, and, considering its well-known property of increasing the action of other medicines, a smaller dose can be used than would be necessary without it. In combination with other agents, small doses of ipecacuanha are often beneficial as a promotor of digestion. From a quarter to half a grain, three times a day, increases peristaltic action, and improves the character of the secretions. It either has a tonic effect of itself, or it acts indirectly as a tonic, by increasing the action of that class of remedies.

It is generally a matter of experiment as to the preparation of iron best suited to the individual case, and more benefit is derived by a frequent change than from the long-continued use of any one preparation. Those in combination with the vegetable acids, as the citrate and tartrate of iron, are always borne if iron in any form can be taken. The tartrate of iron and potassa, from its tendency to relax the bowels, or rather not to constipate, is also an excellent preparation. When a change becomes necessary, the mistura ferri composita should be tried, than which we have few preparations of iron better fitted for giving tone to the organs of digestion. As soon as the stomach becomes tolerant to other preparations of iron, I generally resort to that time-honored one, the tincture of the perchloride, which, after all, is probably the most reliable preparation in the Pharmacopœia. After it has been made several years, and is in a condition in which it is usually thrown out by the druggist, it causes less headache, and is best tolerated by the stomach, owing to a certain amount of free acid which it then contains. It can be taken with a little water, in drachm doses, when ten drops of the recent preparation would not be so well tolerated; and, although the effect on the teeth is objectionable, this can be avoided by carefully using a glass tube, and afterwards the tooth-brush. There are various preparations of iron, recently manufactured, which can be given in an effervescent form—one always most acceptable where the digestive powers are not good.

The same rules of diet as would be applicable in general practice are to be followed, and the individual peculiarities of each case must determine the treatment.

Before a patient is able to take a certain amount of exercise, the food must necessarily be more concentrated, be given in less quantity and often, in the same manner as would be directed for a convalescent.

Until the patient becomes tired of its use, an important article of diet is freshly-made concentrated beef-tea. Raw beef thoroughly rubbed up in a mortar, then seasoned and made into a sandwich, will be of service, until the tender-loin of a beef-steak can be digested. Milk and cream should be given in such quantities as the patient may be able to digest, and if a liberal amount of salt be added to the milk, it will be less constipating, and will be found to agree with a larger number of persons.

One great object in the use of concentrated food is to obviate any accumulation in the bowels, since the great difficulty generally is to keep the bowels regular while the patient is unable to take exercise. Purgatives cannot be employed all the time, and we have already noted the necessity of relieving the circulation in the pelvis by keeping the bowels free from accumulations.

It is advisable to administer cod-liver oil as soon as it can be borne without disturbance, and if taken towards the completion of digestion, instead of just after a meal, it will remain so short a time in the stomach that it is not likely to disagree. An excellent substitute and one often better tolerated, is the fat of pork properly prepared. I direct a thick portion of a rib piece, free from lean, to be selected and allowed to remain in soak for thirty-six hours before being boiled, the water being frequently changed to get rid of the salt. It should be boiled slowly, and thoroughly cooked, and while boiling, the water must be changed several times by pouring it off, and fresh water nearly boiling substituted. It is to be eaten cold in the form of a sandwich made from stale bread, and both should be cut as thin as possible. It is very nutritious, but it should only be given in small quantities until a taste for it has been acquired. It is the most concentrated form in which food can be taken in the same bulk, and I have frequently seen it retained when the stomach was so irritable that other substances would be rejected. For this condition of the stomach it may be rubbed up thoroughly in a porcelain mortar and then given in minute quantities at a time. It is made more palatable by the addition of a little table salt, and this will be well tolerated, while the salt used for preserving the meat having become rancid, if not soaked out, will produce disturbance in even a healthy stomach. I some years ago saved the lives of two of my children, who on different occasions were suffering from cholera infantum, by feeding them entirely on the fat of pork prepared in the way I have described, and, while nothing else would be retained on their stomachs, not only was it retained, but it also had a beneficial effect on the diarrhœa.

This would prove a most useful article for the sick and dyspeptic if we called it by another name; and as the prejudice against it is naturally great, the patient had better become accustomed to its use before learning any particulars as to its character.

I have frequently found coffee, even when taken weak, to exert a very deleterious effect in women who are suffering from uterine disease, in consequence of its indirect effect on nutrition, through its influence on the nervous system. When tea is taken to excess its effect is equally bad, since it likewise disturbs digestion, and destroys all appetite for animal food. Nutrition becomes so much impaired that the local disease may be almost accepted as the consequence, and not the cause, with a large number of patients who have become dependent on the stimulating effect of either of these agents. In my private hospital coffee, well diluted with milk, is allowed on but one day in the week, while I place no limit on the use of weak tea. When the use of tea has not been excessive, I find it even beneficial, since the effect of its moderate use is that of a tonic, so far as it arrests the waste of nervous tissue, without a subsequent depressing influence. Coffee, on the contrary, is a powerful nerve stimulant, but its use is always followed by a stage of depression, well marked in a class of cases already suffering more or less from nervous derangement.

I have already referred in a brief manner to the abuse of stimulants and anodynes; but before closing the subject of general treatment it is necessary that I should again consider these agents in relation to their legitimate use.

Stimulants are often very beneficial, when occasionally taken with the food to assist digestion, and, under proper direction, as a remedial agent. But we are all cognizant of the fact that there are many instances where the use of stimulants has become a confirmed habit, through the culpable error of the physician in ordering them without proper and explicit directions. But few women are safe after once they have fully experienced the grateful increase of strength temporarily induced by these agents. This is due to the fact that they suffer, at times, from a degree of prostration attending diseases of their organs of generation, seldom experienced by the other sex. From the use of these agents, as with coffee, the state of prostration is often very great with some women, on account of the condition of their nervous system. A frequent resort to stimulants becomes, therefore, more necessary to them than to men, and consequently the habit of intemperance is more easily acquired by sick women. This, however, is not true with them in a state of health, since the innate sense of duty and moral obligation is so much stronger in woman, that she would be less likely than man to yield to temptation.

I frequently direct that one or two wineglasses of good claret, Burgundy, or dry sherry be taken with the principal meal in the middle of the day; and when a patient is very feeble, I sometimes order a glass of sherry with a fresh egg beaten up in it, to be given with a cracker before breakfast. Stimulants are frequently ordered to be taken on an empty stomach at bedtime, when a patient is habitually wakeful. This I believe to be very injurious, since the digestion is likely to be deranged from it on the following day; and the practice cannot be continued, even for a short time, without establishing it as a necessity. It is better instead to give some light food, which will often relieve the brain sufficiently, as digestion takes place, to cause sleep. Unless the claret had some body, such as Burgundy possesses, it is liable to become acid, and, on this account is better taken pure than diluted. These wines, by aiding digestion, improve rapidly the quality and quantity of the blood, while the use of whisky is of little if any benefit in this respect.

To relieve the sudden and distressing sinking sensation, due to deficient action in the solar plexus, and to which, females suffering from any uterine disorder are so liable, a camphor mixture, comp. spts. of lavender, aromatic spts. of ammonia, or the ammoniated tincture of valerian, will be found to answer better than any stimulant of an alcoholic character. As soon as the patient is able to exercise in the open air, all stimulus had better be discarded, unless there should exist some reason to the contrary, and reliance be placed on the good effects of fresh air and sunlight.

On the administration of anodynes there remains but little additional to be said, beyond reiterating the necessity for exercising great caution in their use. Giving these remedies to relieve the many bad feelings and sleeplessness of nervous bed-ridden women is a great error in practice, since their use but adds to the difficulty, with the certainty, almost, of creating the habit of dependence upon them. These symptoms are but the outcries of nature indicative of the want of fresh air, sunlight, and a better regulated circulation of the blood; so that every step taken to afford the patient the benefits of these essentials is made in the proper direction. The different means already suggested must be employed, and, to improve the condition of the circulation, the surface of the body and extremities are to be frequently and thoroughly rubbed. Rubbing and mild massage can be very advantageously employed to relieve the restlessness and wakefulness of a person unable to exercise. Other local means will be referred to hereafter, but this method must be employed to an extent sufficient to cause the patient to fall asleep from sheer fatigue. The different preparations of bromine, iodine, calcium, and ammonia will be found most useful. Some light but concentrated food given at bedtime, after a thorough rubbing, will often produce a good night's rest, and this is further advisable, since the whole night is often too long a period for many patients to fast. We must, then, by one substitute or another, gain time and avoid, if possible, the resort to chloral or opium in any form.

Unless the patient be suffering from inflammation, as from an attack of cellulitis, where rest is essential, she must be gotten out of bed and into the open air as soon as possible. There never was a greater fallacy in practice than to place in bed a woman suffering from uterine disease, with the expectation that she would recover her health by remaining there. The loss of tone to her general condition will be greater than any benefit to be gained from the confinement, even when combined with a well-judged course of local treatment. She will not be confined long in bed before her general health must become so far affected as to make her more sensitive to all nervous impressions. At length, if an attempt be made to sit up, the actual suffering, produced by the blood again distending the vessels, when in the upright position, will cause her to desist from the attempt. After having remained in the horizontal posture for a length of time, the vessels of course diminish greatly in calibre, being relieved of the weight of the column of blood. When assuming the upright position, these vessels are again distended, and few patients have the courage to persevere, since they always attribute the suffering to the continued existence of the local disease. Women are sometimes able to remain for years in bed without their general health apparently suffering from the confinement. This degree of tolerance, however, is not brought about until a stage of acclimatation (adaptation), as it were, is gone through with, during which time the general health suffers. In the end, the local disease may improve, or even disappear by the rest, yet, in spite of an improvement in the general health, the patient will remain an invalid, as she will have already contracted the habit of being sick. This is the history of becoming a confirmed invalid, due, in the beginning, entirely to the ignorance, to the indifference, or to the want of an honest purpose on the part of the attending physician. We may charitably attribute the result to ignorance, in the greater number of cases, and to a degree of ignorance which would not be tolerated in the practice of any other branch of the profession. There is a stage in the progress of nearly all diseases of the female organs of generation, developing in early life, which, if recognized and properly treated, may end in a complete restoration to health.

A young girl should never be subjected to a physical examination without the fullest indication of its necessity, nor should the examination be made by one incompetent to judge fully of her condition. But nevertheless she is not free from a certain liability to local disease, the result of accident or imprudence. She may, for example, have a fall producing retroversion of the uterus, or by getting her feet wet, suffer from an attack of local cellulitis. Surely the medical man in charge would be culpable if, through consciousness of his inability to make a diagnosis, or from indifference as to the result, an investigation were withheld on the plea of her youth. The instances are common in which such cases are neglected at the beginning, for the reason assigned, and the assurance is given that relief will be obtained by rest and time. Too often the fulfilment of the promise is not made good, and the patient comes to be a confirmed invalid, and to depend on the use of stimulants or anodynes. Let us suppose the case of a young girl seized with diarrhœa, whose physician, after directing that she should be kept quiet, were to make no further investigation out of respect to her modesty, but should allow the case to drag on until it was thought that she was old enough for an examination. Let it be then found that the diarrhœa had become chronic, with ulceration and thickening of the whole colon. Should the responsibility of the physician cease in the case when he advises the patient to consult some one who had paid more attention to such diseases than he had? But no physician would allow the diarrhœa to go on without informing himself as far as possible of its cause, and he would employ every means at his command, and act on the advice of others, to check its progress. Such results of ignorance or neglect are often met with in gynæcological practice; and the cause which I have supposed in this instance is only one of many equally simple, which are capable of originating grave disorders. We may also call attention to the evil consequences of failure to fully investigate the case, not only of young girls but of women of any age. Often time is thus lost, and the patient even rendered incurable, by the mistaking of a symptom for the disease. Can we cite a more common instance than that of retroversion, when the displacement is frequently never suspected, and months are lost in attempting to treat the first and only condition detected in the case, viz., a supposed ulceration on the cervix, a lesion of little consequence, and one which would likely disappear on correcting the displacement, and restoring the circulation in the organ? The bad health of many a woman has begun in a simple displacement, and ended in her becoming bed-ridden from recurrent attacks of cellulitis, or from the irritation extending to one of the ovaries, producing enlargement and prolapse.

There are many instances where women have become bed-ridden in consequence of too much importance being attached to the local condition, by the physician, or where he has failed to check by the exercise of a stronger will the growing tendency on the part of the patient to chronic invalidism. These women are always most intelligent and plausible, but with a full development of the nervous element. After a certain time has been spent in bed no amount of argument can be advanced to make the slightest impression; in fact the physician is helpless, since every point he may take will be ably refuted. I have been consulted by cases of this description when not the slightest evidence of any uterine disease could be detected. Yet they would continue to remain bed-ridden until a fortunate fire, a fit of anger, or some other powerful stimulus, brings by accident the relief they have not been able to obtain. Notwithstanding this subject has already been treated of at great length, its importance will justify the recital of two instances, which, among others, have passed under my observation, to illustrate how much may sometimes be accomplished under favorable circumstances.

Several years ago I was sent for to see a young married lady, residing in the western part of this State, who had been a helpless invalid, and confined to her bed for some five years. I made my examination about nine o'clock in the morning, but with great difficulty on account of her apparent feebleness. In fact she would have deferred the examination on account of her condition, were it not that great importance had been attached to my visit, which had been unavoidably put off several times on account of my business. I was surprised to find no uterine difficulty except a slight degree of retroversion, and the organ rather lower in the vagina than natural. Certainly nothing to keep her in bed, as there was not the slightest tenderness to be detected by the finger at any point. I was puzzled to make up my mind as to what course to pursue, for I was satisfied that if any local disease had ever existed it had gotten well without her being aware of the fact. I felt that it was necessary to get her out of bed, without the mortification of knowing that no local disease existed, and that I would fail if she were told the true condition. It was Sunday; I was obliged to remain until night before the arrival of the train; it was in the country and in the midst of a snow-storm; there were some eight hours at my disposal, and I determined to devote the day to her case, and see what could be accomplished by force of will, after gaining her confidence. I first entered into the fullest detail of her past history, but could elicit from her little more than monosyllables. I then branched into literature, science, and the arts to the fullest extent of my knowledge, but at the end of two hours I had apparently made no impression, and was almost in despair of being able to find any subject of common interest to us. At length a casual remark about autographs promised better, for I then learned that in the garret there was stored away a collection made by her a number of years before. I had it hunted up, and soon found that I was making progress. I gradually got her interested sufficiently to lie on her elbow, and tell me all the particulars as to who the local celebrities were, and under what circumstances each letter had come into her possession. After I had talked steadily for more than two, and she for three hours, we had become the best of friends, and I began to think of getting her up to dinner. I suddenly asked, "Are you not now relieved of that feeling of great pressure from which you have suffered so long?" With an expression of surprise, she said, "Why, yes, entirely so." "That is just as I expected," I remarked, "so we will send for your maid to get you ready for dinner, since you are not going to let your husband and myself dine alone when you are so much relieved." "Doctor, are you serious, do you think that I can get up?" "Certainly, I know that you can; and for what purpose did I come from such a distance, but to relieve you?"

I had her limbs thoroughly rubbed, clothing hunted up, and then assisted her in to dinner. She occupied a seat alongside of me, and I exerted myself to the utmost to keep her interested, and the conversation from flagging. After the lapse of half an hour I saw that she was too much exhausted to remain up longer, although she was making every effort. She remained lying on the sofa for an hour or two, and then, at my suggestion, walked with the aid of her maid up and down the entry for a while, "to test what I had done." When I left the house for the train, she waved a farewell to me from her bedroom window. Two weeks afterwards she walked into my office in New York, and has since been well.

This case was one in which the physician supposed some local disease existed, and had insisted on her remaining in bed. Her general health soon began to suffer; she afterwards regained her strength, but the habits of an invalid were then so confirmed that she continued bedridden. Fortunately for her, she was over-impressed with the importance of my visit, and almost prepared for the performance of some miracle as the result of my skill. Yet, withal, I should have accomplished nothing, but for the fortunate circumstance of the autographs, by which I was enabled to get under the shell and gain her personal confidence.

With the history of this case before us, it will not be out of place to refer again to the absolute necessity of gaining this personal influence over a certain class of patients before any great advance can be made in the treatment. It is not sufficient alone that the patient should have every confidence in the skill of her physician, for, in certain conditions of the nervous system, it will avail little without the personal influence. There lies the great difficulty, and one often insurmountable, of ever gaining this influence, through either confidence or fear, over a patient treated at home, and surrounded by sympathizing friends. I have labored for hours and days, without the patient being conscious of it, to gain this influence and to create a feeling of dependence. With it comes, on her part, the firm conviction of her recovery. As I study her peculiarities, I gain a more accurate knowledge of the inner woman than she herself possesses, by getting at the deep under-currents which may have been running awry, through the greater part of her life, and to the detriment of her nervous system. She, herself, will give me all the information I need, with the confidence of a child, yet, afterwards, will credit me with a degree of penetration undeserved, but with the effect of adding greatly to my influence. To attain this point fully repays the physician for his labor, since the patient then loses sight of herself, and is only anxious to carry out his views without question, and simply because he wishes it. This influence enables a patient to keep her nervous feelings under a healthy discipline, so much so, that nothing would mortify a patient in my private hospital more, than for me to doubt her power of self-control. This influence is not to be gained by any degree of intimacy or sympathy, but rather the contrary. When necessary to accomplish it, I aim to gain absolute and entire control over the patient, to understand every thought and motive, and to direct her as a child. Those who suffer from hysterical disturbances or other nervous disorders cannot be properly controlled and directed without the exercise of this influence by a will stronger than their own. I have met with other instances where they have become intensely selfish and willful, so much so, that no influence could be

and to get them out of bed
if it becomes necessary to

married woman was brought to
States, through the advice of Dr.
She was moved on a stretcher,
fined to her bed for some four
a skeleton in the house, from the
as she was unable to feed herself
ly sleep at night with the gas
member of the family to sit up with
that to annoy those in charge of
rely have a movement of the bowels
When I attempted to examine her, she
id and straight out, she would not
her eyes shut. By watching the
that every portion of the vagina was
was not sure but that she was enjoying
ling me. I, however, could detect no
was rather larger than natural, and very
mother, an aunt, and several members
waiting to hear the result of my investi-
pared to spend the winter, and be on the
der treatment. This circumstance em-
e condition of the patient, but I quickly
o be followed. I told the father that I had
it was necessary that I should not enter
and, to enable me carry out my plan, he
home by the next train, and without taking
If they did this, I felt certain that I could
ling, they must seek the advice of some one
ding to my business, they remained staring
rise, with great indignation, and did not make
course to pursue until the last moment, in
I went up to see her afterwards, and found
closed as I had left her. I remarked, "Well
the hands of the Philistines, for your father,
of them have returned home without even
d I have now got you entirely in my power."
n impression, but she soon recovered herself.
ouse were but parts of a machine, with no

thought beyond carrying out my instructions. That I was a very devil when roused, and bade her look at me well, and see if she did not think I was fearfully in earnest. I noticed that her eyelids slightly parted, as curiosity tempted her to see if I was really what I represented myself to be. I continued, and stated that as long as I had my own way I was as gentle as a lamb, but I would give her fair notice that she would live to regret it if she ever deviated from my instructions. "To-morrow," I said, "at ten o'clock, I will begin to see the patients in the office, and you must be dressed at that time. I will call for you, and if you are not dressed, I will play the lady's maid, and with no light hand, for it will be a very busy part of the day with me. I shall remove that nightgown, and put on your flannel underskirt," etc. I then slowly enumerated, in order, every article of female dress I could think of, even to a napkin. This was too much for her, and she opened her eyes, saying "You are a brute, sir." I directed that her meals should be placed alongside of her bed, that she might feed herself, but I believe she ate nothing. She was told, that until she could be civil, she would be left to herself as far as possible. At nine o'clock her gaslight was turned out, and she was heard sobbing several times in the night, as the nurse passed back and forth in the passage-way. In the morning, I learned from the nurse that she evidently intended to have it out, and that nothing whatever could be done with her. At ten o'clock I entered her room, but her courage had failed her at the last moment, on hearing my footsteps, and she was wildly trying to pull on a stocking under the bedclothing. I saw at a glance that I had conquered. I spoke to her kindly, bid her lie down, and said that I was glad to see she had made up her mind to help me, and as she was still fatigued from her journey, she could rest until the next day, but that she must then be up. During the day she was quite friendly with the nurses, and the next morning I found her dressed with their aid. I gave her my arm to assist her to the elevator, helped her into the office, and made a most satisfactory examination. She remained for half an hour on a sofa in the parlor, and then I allowed her to return to her room. In a few days she was out riding in a carriage, soon she was able to walk out, and at the end of a month she returned home well. She became very much attached to me in a few days, and I never had a more tractable patient. The treatment consisted in hot-water vaginal injections daily, several applications of iodine over the whole vaginal canal. She was also well rubbed twice a day, from head to foot, had all the fresh air and sunlight she could get, and some medicine to regulate the bowels.

At the risk of being tedious I have entered more into a detailed history of these two cases than at first glance might seem called for. The contrast between the two cases was very great; and it was necessary that the plan of treatment should be different. The first patient had preserved all the characteristics of her sex, and through a sense of duty, might at any time have made the effort to throw off the habits of an invalid. At least she would not willfully have refused to listen to advice, although she may have felt satisfied, she could not follow it. But, with the last case there was but little more than the instincts of the animal left, for she was not moved through any sense of modesty, but from fear, as she acknowledged afterwards, that she thought I looked as if I might spank her. I was aided through the helpless condition she felt herself in, alone among strangers, and through fear of punishment she was conquered. But after she had once yielded, and all were now kind to her, it was not necessary for me to tell her to make the exertion, for she knew that I wished it, and this excited a desire on her part to prove herself worthy of my confidence. In a kind manner I had quietly pointed out to her certain serious defects which it was advisable for her to correct. The effort then made by her to carry out a purpose in overcoming her temper, and subjecting herself to this self-discipline, brought out all the good traits of her character.

To carefully watch for and check any disposition on the part of the patient to fall into the habits of an invalid is quite as much a part of the duty of the physician as to prescribe for her general health, or to treat her local condition. Unless there should be a necessity for remaining in bed, the physician should insist upon the patient being regularly dressed every day, not to remain in a wrapper or dressing gown, but to complete her toilet as if she were going out. Let it be the exception to the rule that breakfast be taken in bed, for this is a bad beginning for the day. When unable to go to her meals, at least require that the breakfast shall be served in another room, even if she has to be carried there, that in the mean time her own may be properly aired for the day. So long as this discipline can be enforced the probabilities of becoming bed-ridden will be kept in abeyance. I have often accepted, with no little satisfaction, the addition of an extra ribbon or bow to the toilet, or the wearing of a trim breakfast cap as a hopeful promise for the future. Let the patient then dress herself each day as if she expected to receive visitors, and even be encouraged to put on her best to make her appearance as attractive as possible. When necessary I insist on this being done as a matter of respect to myself. Notwithstanding the exertion is a fatiguing one, it occupies her mind, and will impart a healthful impression to the effect that she is not as sick as she would feel were she to remain in bed. The difficulties to be overcome seem, sometimes, almost insurmountable in carrying out any plan of discipline as has been advised. Yet it is beyond question the duty of the physician to persevere in the effort to the end, and even if a compromise has to be made, what is gained will aid him greatly in the successful management of the case. I am always on the lookout to turn every circumstance to my advantage, and have frequently prescribed some article of dress as I would a tonic.

Two years ago a lady from the South came under my charge, who had been confined to her room about six years, that is, since the birth of her last child. She was not bed-ridden, but had suffered after her confinement from so much pain and bearing down, when on her feet, that she had gradually fallen into the habits of an invalid. She would seldom remain in bed all day, but would be partially dressed, when she felt so disposed, and then lie on the bed or sofa in a wrapper. I found, having been confined to her room so long, that her wardrobe was so far incomplete as to be wanting in a dress. To the surprise of herself and friends, my first prescription was a hoop-skirt and a black silk morning dress to be made in the latest fashion. I insisted on having these procured before doing anything else, and as I found out that she had never worn a hoop-skirt I looked forward with great interest to its beneficial effect. By my direction, she was dressed in full one morning, but I believe the hoop-skirt was not a success, from the difficulty in arranging it as she lay on the bed. But I confiscated the wrapper, and, as if by accident, had her left alone. My anticipations were fully realized, for, on going into the room shortly afterwards, I found that her curiosity had conquered, for she was in front of the looking-glass observing the general effect, and arranging her hoop-skirt. I had also ordered a fashionable style of bonnet to be purchased, which was then put on and she was sent out for a drive before she had time fairly to realize the situation. Having thus once broken the spell, the treatment of her case progressed rapidly.

Notwithstanding the capillary circulation is so feeble in many women, they do not require, for their comfort, as much clothing to protect them from the cold as do men. Although they may experience no sense of discomfort at the time, yet the exposure to which they are subjected, even for healthy women, is attended with deleterious effects on the circulation of the skin and extremities, by leading to habitual congestion of the viscera. In an equable climate, nature might establish from habit a degree of tolerance, but, subjected as we are to such great and sudden atmospheric changes, it is impossible always to escape the consequences, even with careful forethought. Most men would perish from the effects of exposure were they no better protected than women who ordinarily are the more prudent. After excluding the bad effects which sometimes follow childbirth and the results of accident, it will be found, I am satisfied, that the great cause of disease in woman is to be traced to the effect of exposure from insufficient clothing. It will have to be the work of time before the public can be educated to realize the necessity for a change in the dress of women as well as in that of children. This subject should specially engage the careful attention of the physician who has in charge a patient suffering from any disease of the class under consideration. This is the more necessary, since in sickness the system is less able to protect itself than in health, and every means must be availed of to improve the capillary circulation, so that the tendency to obstruction in the larger vessels may be removed.

In winter a flannel shirt and drawers, to be worn next to the skin, are essential. In warm weather a lighter flannel shirt can be worn, but it should never be wholly dispensed with. At night, the flannel worn through the day should be exchanged for a fresh garment, and, although one of a lighter material may be used for the night, it can be safely laid aside only by one in health. The flannel drawers ought to be closed below the knees in winter by an elastic band, but in summer they may be made open, and of cotton. Linen is totally unfit for our climate, even in the warmest weather, and I never allow its use at any season, but have cotton at once substituted. Woollen stockings are necessary in cold weather, even when the woman is confined to the house, since the floor is always the coldest part of the room, and the feet are exposed to draughts. If appearances are to be regarded, the compromise should be in covering the coarser stockings with a pair made of finer material. The use of cotton or silk will answer in summer if the woman is not so feeble as to suffer from cold feet at that season. Thin-soled slippers are inappropriate for an invalid, even for use in the house, since the feet are not properly protected unless the slippers are lined, or made of cloth. Too much care cannot be given to the proper protection of the feet, and the soles of the shoes should not only be thick enough to keep the feet dry, but also warm. To the absurd habit, and one too common among young women, of walking out in low shoes, and with soles only fitted for a ball-room, may be traced much of the cellulitis with its consequences, and the sterility of after life. A flannel petticoat is now universally worn in winter, but it is seldom long enough. Its use in summer should not be dispensed with except in very warm weather, and then it should be put on again in time to be a protection should the weather change. A better plan is to wear around the lower portion of the abdomen, throughout the summer, a single thickness of a flannel bandage, wide enough to reach from the hips to the umbilicus, and which can be secured with tapes. It may be cut bias so as not to cling so much to the body, while at the same time it will be more elastic. The omission of flannel is entirely a matter of habit, for the heat is rarely so great in our climate but that a light flannel may at all times of the year be worn next to the skin, not only with comfort, but as a most valuable means for the preservation of health. The object is not to keep the surface of the body bathed in perspiration by an excess of clothing, but covered by flannel of a sufficient thickness to keep the skin active, and at the same time protect it, at all seasons of the year, from sudden changes. In women it is particularly essential to protect the lower extremities, for as long as the feet are cold there will be an increased quantity of blood in the pelvic vessels. Whenever a patient is suffering from congestive hypertrophy of the uterus, or of one of the ovaries, or has still the remains of an old cellulitis, she will inevitably experience an increase of pain about the pelvis whenever the feet become cold, and even before she has been made conscious of their condition by any other sensation.

The selection of a room to be occupied by an invalid should be made with the view of obtaining the greatest amount of sunlight and a good outlook. If it can be avoided, there should be no wash-basin, connected with the sewer, in the room, nor a water closet in the neighborhood, since women who are debilated from diseases of the genital organs are particularly susceptible to the poisonous influence of sewer-gas and malaria. As long as the patient is able to leave her room, she will be able to find occupation for both body and mind. But when unable to do so, every means must be employed with the view of breaking in upon a life which can be but a monotonous one under the most favorable circumstances. With this object, it is necessary to move the furniture and pictures frequently, not only from one part of the room to another, but to substitute others when practicable, and the position of the bed itself should be frequently changed.

Whenever the system has become weakened, the strength of both body and mind must equally suffer. A woman in this condition can rarely be restored to health by any local treatment, or by tonics and some attention to regulating the bowels, yet this is the course generally followed. It is really necessary to give occupation to both body and mind, that her life may be modelled in accordance with an explicit course directed by the physician. The main object is to bring about the utmost degree of regularity in all her habits, by which course alone we can hope to effect a change for the better in the function of nutrition. Moreover, from the well-recognized influence of the mind on the body, in these diseases, it is equally essential that it should be kept constantly occupied under such influences as are the most conducive to health. It is a serious complication for a physician to have in charge a woman, from the upper walks of life, without occupation or tastes that may be so directed as to afford her some congenial employment. Among the poorer classes this is not so necessary, since the brain is less active, and with them it is more a question of rest, better diet, and time.

The hours for meals should be designated, that for dinner being placed between one and two o'clock. The hour for retiring should not be later than ten o'clock, and, as a woman, even in health, needs more sleep than a man, she will require at least nine hours. The amount of exercise to be taken must be regulated each day by the physician, in accordance with the progress made, and the special nature of the treatment; the best hour, except in summer, being about noon. Even receiving friends, reading, and employment in needlework, drawing, or any other occupation, I am obliged frequently to insist shall be done at some stated hour. But when I find a patient appreciating the necessity of regularity, and anxious to occupy her time properly, I prefer to leave the details to herself, as an additional source of occupation. The great problem, in nearly every case, which will tax both the skill and patience of the physician to solve, is to regulate the bowels, with the least resort to medicine, and to establish habits of regularity. A regular hour must be settled upon for the movements of the bowels, either in the morning, or at night before going to bed. Many of my patients find the hour of bedtime the most convenient, especially when they are obliged to resort to the use of an enema. By having a night of rest afterwards, they are spared the fatigue which many experience for hours after the bowels have been moved in the morning. I have also met with several patients who only slept well when the bowels had been emptied just before going to bed.

As the treatment of the diseases of the female organs of generation embraces, in some form, the whole field of the practice of medicine, it is not possible to do more than to offer general suggestions bearing on the more prominent features. For the successful treatment of these diseases, a more general and accurate knowledge is requisite than in the practice of any other branch of the profession, since, through the influence of the sympathetic system, as we have already seen, reflex irritation and remote functional disturbances are the rule. The advocate for either general or local treatment exclusively, or he who neglects to give the proper attention to both, does not possess sufficient practical knowledge to extend his usefulness beyond the range of an empiric. The successful physician or surgeon is eminently noted for his personal attention to details. The most profound knowledge adds but little to the success of practice if the details are not looked to, and many a brilliant operation has failed, and even entailed disastrous results upon the patient, for the want of this care in the after-treatment. The purpose of this chapter has been, and the object in view throughout the work will be, to impress the reader with the fact that *success in the treatment of the diseases of women lies wholly in attention to minute details.*

CHAPTER VII.

LOCAL TREATMENT.

The condition of the circulation in the pelvis—Its influence on local disease—Must be corrected before any permanent advance can be made—The effects of electricity, cold and heat in exciting contraction of vessels through reflex action —Hot-water vaginal injections; history and mode of use.

It has been stated that the sympathetic system of nerves presides over nutrition and the organs of generation, and that every blood-vessel, to the minutest capillary, is covered by a network of nerve filaments communicating directly with the different ganglia. When nutrition is impaired, there is naturally a want of tone in the blood-vessels.

From various causes, already cited, the veins of the pelvis become gradually over-stretched, and finally lose their tone to such an extent that almost a stasis of the blood takes place; at least to such a degree that we may compare the circulation in the pelvis to that existing in a marsh, saturated by a stream which is of about equal capacity on entering and leaving it, but maintaining a condition approaching stagnation between the two points. As a consequence of this venous congestion we have increased size and weight of the organs, causing an augmented secretion. Whenever we are able to improve the general condition of a patient suffering from disease of the organs of generation, the local condition improves also, but only to a limited extent. Yet this increase of strength renders her better able to bear the constant drain set up by nature in efforts to relieve the congestion by an increase of secretion. But no permanent improvement can take place, in the local condition, until tone has been restored to these vessels, so that the circulation may be as little impeded in the pelvis as in any other portion of the body. We may by rest, or by restoring the uterus to its proper position, lessen its size, and by the same means, aided by local applications, at length heal an erosion, as well as lessen the discharge from the uterine canal and vagina. But the case will relapse, and at the end of a few weeks or months after the patient has begun to exercise, the original condition will have been reproduced. It is only by exciting reflex action that these nerves, accompanying the vessels, will cause their contraction, and with increased action on their part the necessary tonicity will be restored by improved nutrition.

We have three agents for exciting this reflex action, viz., electricity, cold, and heat.

Electricity exerts a decided effect during the time of the passage of the current, but the impression is too transitory, and the agent is only to be relied upon as a valuable adjuvant.

Cold is a prompt excitor of reflex action, by which the vessels contract, but on reaction taking place the parts will become more congested than before, with both the arteries and veins distended.

Heat, unless at a temperature which would destroy the parts, does not act as promptly in causing this contraction as either electricity or cold. In fact its immediate effect is to cause relaxation, and to increase the congestion of the parts; but if its application be prolonged, reaction ensues, and contraction takes place; in other words, the reaction from heat is contraction. The capillaries are excited to increased action, and as they contract from the stimulus of these nerves, the tonic effect extends to the coats of the larger vessels, their calibre in turn becomes lessened, and with this approach to healthy action the congestion is diminished. The popular belief is that heat relaxes and increases the congestion of the parts, and such indeed is the case at first. But a hot poultice is never applied with the object of increasing the congestion, but, as any "old wife" would express it, to draw the "fire" or inflammation out; in other words it lessens the congestion by stimulating the bloodvessels to contract. That such is the effect, from the continued use of a poultice, is familiar to every one, and is shown by the blanched and shrivelled appearance of the tissues after its removal. The hands and arms of a washer-woman become swollen at first, from the increased flow of blood, when in hot water, but the fact is quite as familiar that they afterwards become markedly shrivelled.

To place the hands in cold water will at once cause the skin to shrivel, as the vessels are stimulated to contract, but we are all familiar with the fact that reaction promptly comes on, and a larger quantity of blood returns to the parts than was driven out; the skin does not recover its natural appearance for hours, and when reaction does take place, by relaxation of the vessels, there will be an approach to congestion. The immediate effect of cold, therefore, is contraction, and with reaction comes dilatation; but the reverse is true of heat, which causes at first dilatation, followed, however, by contraction.

With these practical points before us, we resort to the prolonged use of hot water, by vaginal injections, to gradually bring about the required contraction and tone in the pelvic vessels. Whenever inflammation exists, we have congestion of the arterial capillaries, and when it subsides, there remains, among other results, the condition erroneously termed chronic inflammation: a condition essentially the same as the one just described, attended with a loss of tone in the vessels and an obstructed circulation, but it is a misnomer, since it is generally found where no previous inflammation has existed. The usual seat of the inflammation, and the circumstances under which it is generally found, have already been stated, as well as the fact that the condition we have chiefly to deal with is the direct result of a loss of tone in the venous circulation throughout the pelvis.

The use of hot water vaginal injections is equally beneficial in all those conditions which constitute the various forms of disease in the female organs of generation, and which are amenable to any treatment other than a surgical procedure; and equally so, whether the congestion be venous or arterial. This remedy is not to be considered a "cure-all," but one of the most valuable adjuvants, under all circumstances, to other means. Yet, so beneficial is its use, except in displacements of the uterus, that I believe more can be accomplished in the treatment of the diseases of women by this agent, and a carefully regulated plan of general treatment, than by all other means combined.

If a vaginal injection has been properly administered, in accordance with the directions given on page 51, the mucous membrane will be found blanched in appearance, and the usual size of the canal lessened in calibre, as after the use of a strong astringent injection. As the patient lies on the back, with her hips elevated, the action of gravity will be brought into play, by which the veins will be rapidly emptied, sufficiently to relieve the over-distension. When in this position also, the vagina will become fully distended by the weight of water and kept so, since only the surplus amount can run off into the bed-pan beneath. The hot water will then be in contact with every portion of the mucous membrane under which the capillaries lie. The vessels going to and from the cervix and body of the uterus pass along the sulcus on each side of the vagina, and their branches inclose the vagina in a complete network. The vessels of the fundus, through the veins of which the blood flows to the liver, and back into the general circulation, communicate freely, by anastomosis, with the vessels distributed to the body and cervix below. If, then, we are able to cause the vessels of the vagina to contract, through the stimulus of the hot water, we can, directly, or indirectly, influence the whole pelvic circulation. It is most important to appreciate the necessity for elevating the hips, by which plan so large a portion of the venous blood becomes drawn off by gravitation. If the stimulus of the hot water is then applied, so as to cause the vessels to contract still more, we will, for a time at least, have the pelvic circulation reduced almost to a natural condition. In order to allow the condition of contraction to be as prolonged as possible, I generally direct the injection to be given at night, in bed, just as the patient is ready to retire. Thus, by constantly causing these vessels to contract, and by resorting to every other means of lessening the supply of blood in the pelvis, we will succeed eventually in securing a proper vascular tone. No plan of treatment could be more rational, or appeal more forcibly to the good judgment of every one. But, unfortunately, from a neglect of details, it is rare that the slightest benefit is derived from the use of these injections, although so many years have elapsed since the profession has been fully informed as to their mode of action.

For fifteen years at least, I have been experimenting by different methods in the use of hot water, and have had during that time as large a number of cases as would be likely to be at the service of any one, and I have arrived at the conclusion that it is an impossibility for a patient to properly give these injections to herself, so as to derive their full benefit. Not the slightest advantage is received from them when administered with the patient in the upright position, or, as is the usual method, while seated over a bidet, for, given thus, the water does not dilate the passage, but returns along the nozzle of the syringe. I have found that the best mode of all is to have the injections given while the patient is placed on her knees and elbows or chest. In this position we have the assistance both of gravity and the pressure of the atmosphere to empty the pelvic veins, while the water is able to act on a much larger surface of the vagina than it is when the patient is in any other position. But this position is a difficult one to assume, since those who are in the greatest need of hot water have not the strength to remain in it long enough to accomplish the purpose; and considerable difficulty is also experienced in keeping the patient dry. This latter difficulty, however, can in a measure be overcome by using a funnel-shaped receptacle, with an India-rubber tube attached to the smaller end, the two sides being indented sufficiently to enable the patient to retain it in place by keeping the thighs together. I have also used an inclined plane to elevate the hips; it should come [illegible] have a hole cut large enough for the but- [illegible] water may flow into a receptacle below. These [illegible] dure which the ingenuity of the physician [illegible] employed, so long as the action of gravity is [illegible] the vagina can be dilated by the water. But [illegible] of cases, the position on the back, with a bed- [illegible]s, will be found the most convenient. Few women [illegible] unable to get some one to administer the injec- [illegible] the inconvenience of soliciting aid is a trifling one [illegible] to be derived from it, since experience has [illegible] details can be carried out fully, the process [illegible] of time, and a tax on the strength of the patient. [illegible] quantity of water are to be varied according [illegible]. When treating the early stages of inflammation, [illegible] that the temperature should be elevated rapidly from [illegible] 110, or to as high a degree as can be borne by [illegible] that the injection should be often repeated. For [illegible] a gallon of water two or three degrees above blood- [illegible] sufficient, but the temperature must be maintained [illegible] point by the addition of hot water from time to time. [illegible] time is generally the best in which to seek for the [illegible] effects of hot water on the reflex system, in allaying the [illegible] for prolonged vaginal injection, at a high tempera- [illegible] when given by an experienced hand, act with more [illegible] an anodyne, in allaying the nervousness and sleep- [illegible] hysterical woman. I have frequently known a patient, [illegible] well rubbed, and having received an injection, to fall asleep [illegible] nurse had completed the process, and to be so overcome [illegible]siness as to be but little disturbed on removing the bed-pan. [illegible] instances, and from a condition I am unable to explain, [illegible] met with where a sense of weight and an uncomfortable [illegible] are experienced about the pelvis after an injection of water at [illegible] usual temperature. In some instances so much disturbance re- [illegible] that occasionally I was obliged to abandon its use. But I [illegible] long since ascertained that the injection is well borne at a lower [illegible]ture, generally about 95°, and that after a week or two the [illegible] can be gradually increased.

[illegible] "cooking process," as it has been facetiously termed, is ren- [illegible] easier by the use of ivory, or some other non-conducting mate- [illegible] the nozzle of the syringe, since the patient suffers more [illegible] from the heated metal surface of the ordinary nozzle coming in contact with the outlet of the vagina than from any degree of heat in the water which it is advisable to employ.

To the injection (generally to the last pint) may be added, glycerine, chlorate of potash, chloride of sodium, carbonate of soda, borax, Castile soap, sulphate of copper, muriate of ammonia, brewer's yeast, permanganate of potassa, carbolic acid, or any other remedy which may seem to be indicated.

As the patient improves in health the quantity of water for the injections may be lessened, and the temperature gradually lowered to about 60°, and then discontinued. But for some months it would be prudent for a few days after each period to resume the injections at a degree or two above blood heat, and to have recourse to them whenever their use should seem indicated, to counteract the effect of some imprudence.

In the summer or early autumn of 1859, during the temporary absence of Dr. Sims, I was operating at the Woman's Hospital to close a vesico-vaginal fistula, where it was necessary to free the tissues behind the ramus. The progress of the operation had been greatly delayed in consequence of oozing of blood, which I had checked by pressure and pieces of ice, but, on resuming the operation, in a few moments reaction would take place, and the bleeding became as great as before. The late Dr. Pitcher, of Detroit, was present, and suggested that I should dip a sponge probang into hot water and apply it several times to the surface; I did so, and, to my surprise, the bleeding was promptly arrested. His explanation was, that, as the clot formed in the mouth of a vessel dilated by the heat, it would be so firmly held by the contraction of the vessel, when reaction took place, that secondary hemorrhage could not occur. He then stated to me he had been in the habit, for many years, when operating, of applying to a bleeding surface sponges taken from water as hot as could be borne.

From the earliest days of my study in this branch of surgery I have been skeptical as to the part inflammation was supposed to play in the diseases of women. Since I first had an opportunity to form an opinion, my views have been essentially what they are to-day, and I have taught the same for years at the Woman's Hospital, as is well known. In fact, my views were formed at so early a date, that I have never applied a leech in my life to the uterus, or scarified the cervix with the view of reducing inflammation. Dr. Pitcher's suggestion made a deep impression on me, but it required years to appreciate its full import. But, having once realized the influence of heat as an excitor of reflex action, it became the means of clearing up for me many points in pathology, and hot water has proved a most important agent in my hands in the treatment of the diseases of women. At the time my attention was first drawn to this subject the universal practice was the use of vaginal injections of cold, and even iced-water. I began to use tepid, and then warm water in my private practice, but at that time my opportunities for personal observation were limited. However, from September, 1862, when I was placed in charge of the Woman's Hospital, to the present time, nearly every patient coming under my care in this institution, as in private practice, has been treated by this method, the quantity and temperature of the water being varied according to the peculiarities of each case.

Yet, I do not claim to have been the first person under whose direction a vagina was ever washed out with warm water; but I do claim to have been the first to use the agent in a systematic manner, for the treatment of the diseases of women, and to have done so with a definite purpose, in keeping with what I considered to be sound pathology.

In every theory of inflammation congestion is, of course, considered a prerequisite stage, but the congestion is commonly supposed to be arterial, and all plans of treatment are directed to overcome this condition.

So far as I know I may justly claim to have been the first to teach, that congestion of the pelvic contents, under ordinary conditions, is venous, and due to loss of tone in the vessels from impaired nutrition. This naturally led me to elevate the hips, so that, by the action of gravity, the congestion might be lessened, and then I applied hot water to bring about a further contraction of the vessels by reflex action, which would lead gradually to a permanent restoration of their tone and calibre.

CHAPTER VIII.

PRINCIPLES OF TREATMENT CONTINUED: DISPLACEMENTS, PELVIC CIRCULATION, LINING MEMBRANE OF THE UTERUS, APPLICATIONS TO THE UTERINE CANAL.

Proper position of the uterus—The essential principle is to remove obstruction to the uterine circulation—Positions either too low or too high are objectionable—Campbell's pneumatic repositor—Chronic inflammation and ulceration do not exist—Remedies: Nitrate of silver—Carbolic acid—Glycerine—Iodine—Use of applicator—Powdered substances—Pith of corn stalk—Sponge-tents to reduce size of uterus—Injections of Churchill's tincture of iodine into uterine cavity—Hot water in the uterine cavity—Blisters to the cervix—Hyperæsthesia is not inflammation.

If the views which have been advanced as to the condition of the pelvic circulation attending diseases of long standing in the female organs of generation be correct, it becomes evident that it is of paramount importance that the uterus should occupy a position where its circulation shall be without obstruction. When the uterus is displaced backward, forward, or to either side, the displacement is generally recognized, and an attempt is made to maintain it by some mechanical means in the upright position. But the true principle for correcting the various displacements is seldom fully appreciated. In general terms, it may be said that there is no common standard by which to determine the proper position for the uterus in all women, but that in each individual there is a point, or plane, in the pelvis which the uterus should occupy when she is in a state of health and not pregnant.

We are all familiar with the fact that the uterus is frequently found extremely anteverted, yet the female will be in perfect health and suffering not the slightest inconvenience. The same is true of retroversion, although this may entail sterility, and the position, from mechanical causes, may render her more liable to some complication; yet, until this does occur, she may pass through life unconscious of its mal-position. Of course, it is advisable to correct a retroversion if possible, but I hold that it is not so much the position which is to be corrected, as it is the obstruction to the circulation in the organ which is to be removed. The uterus may occupy a position in the axis of the pelvis which might be faultless, by comparison with any accepted standard, yet the disturbance may be as marked as in an extreme case of version, should the organ occupy a lower plane in the pelvis than is normal. As soon as the uterus settles to a plane below the health line, as it may be termed, the tissues will be put on the stretch sufficiently to compress or obstruct the veins, while the arteries will not be affected. This is just the condition in pregnancy when, from the settling down of the uterus, the veins become distended to an enormous size. As the organ grows, the additional weight continues to add to the difficulty, by inducing congestive hypertrophy. With pregnancy, the obstruction to the circulation is relieved a short time after quickening, and the vessels are able to regain their natural size, but towards the close of gestation the venous circulation is again impeded by the upward traction.

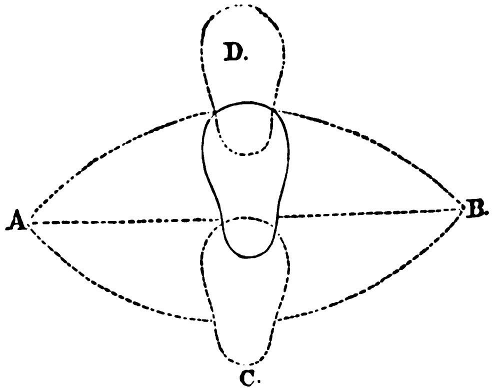
While writing, I recall the history of a case sent me by Dr. Woolsey Johnson, of this city, which shows the importance of recognizing the existence of this health line. I mention the doctor's name in connection with the case, from the fact that he watched the progress of the treatment closely, and was familiar with all the details. When I made my first examination, nearly every portion of the vagina, as well as the cervix, was extremely sensitive on pressure, and the pulsation of large vessels could be felt at different points. This condition had existed to some extent for several years, having followed a severe labor with her first child, but had been much worse after wearing a pessary, which it had been thought necessary to introduce. The uterus was about four inches deep, and very much anteverted. She of course suffered with backache, difficulty in standing or walking, and from leucorrhœa. I recognized the importance of lifting the uterus in the pelvis, but with the sensitive condition of the vagina, a pessary at the time could not have been tolerated. To a certain point, she improved rapidly from the use of hot water injections and the application of iodine over the vaginal surface. During a subsequent examination, the patient lying on the back, I lifted the uterus gently on the end of my finger, to judge whether its mobility had been lessened by the remains of an old cellulitis, which had occurred behind and to the left of the organ. At a certain point she remarked that the backache was relieved ; the uterus was then lifted higher, but with a return and increase of the pain ; it was then allowed to settle again, with relief, and a return of the pain was experienced as the organ reached its usual low position. I then slowly and gently lifted the uterus again to a plane in the pelvis at which the pain ceased. At this point I held the organ for some ten minutes, giving her great relief, and at the end of that time the pulsation in the arteries had ceased, and the quantity of blood in the veins diminished. This was done day after day, until she was able to go for a longer interval before returning pain and discomfort rendered it necessary to be repeated. The uterus decreased in size, the tenderness in the vagina became less, and at length she was able to wear, with comfort, a pessary, which held the uterus in its proper place in the pelvis. Notwithstanding that she suffered from two attacks of pneumonia and one of dysentery, within a year, and that her general health was much impaired before she came under my charge, she is now essentially well of her local difficulty. The treatment consisted in the injection of hot water, properly administered, daily, and in her placing herself on her knees, and letting the air pass into the vagina to lift the uterus whenever she felt the necessity for doing so. Dr. Johnson, at the same time, looked after her general health. The uterus was lifted into its proper place, and a pessary was fitted, which she continues to wear; iodine was applied occasionally to the vaginal walls, and pledgets of cotton saturated with glycerine were frequently placed in the vagina. No application of any description was made to the uterine canal, for fear of lighting up the old cellulitis.

The practical lesson to be drawn from this case is that the cellulitis was, in all probability, caused by a pessary which lifted the uterus too high in the pelvis, above its natural position, by which the connective tissue was put on the stretch. Involution of the uterus had not been perfect, and from the obstruction to the circulation due to the cellulitis, the size of the uterus had been increased so as in turn to be an additional source of irritation. But the most important feature of the case is one which has been already referred to, and will again be considered at length. The greater portion of the weight of the uterus was suspended from the shortened broad ligament which had been the seat of a previous cellulitis, so that the circulation through both the arteries and veins was obstructed. The arterial congestion rendered the parts more sensitive, and brought about a condition which made her liable, on the slightest provocation, to a fresh attack of cellulitis, while the venous obstruction increased the hypertrophy, and caused the profuse leucorrhœa. As soon as the uterus was lifted in the pelvis to a point where the drag on the tissues, which had been previously inflamed, ceased, the circulation at once became restored, and the pain was relieved.

This case illustrates an effect resulting from one of the commonest errors committed in practice—that of lifting the uterus too high in the pelvis. Many an expert succeeds in fitting an instrument which will prevent the uterus from becoming again retroverted, but often fails to appreciate the plane or height at which the uterus should be held in the pelvis.

Let the line A, B (Fig. 40) represent the line or plane which the uterus occupies in the individual when in a state of health, and at a point where the blood flows to and fro without obstruction. By some accident the uterus becomes displaced, and has its circulation so obstructed that by increased weight it at length prolapses, or sags, to the point C, and causes so much disturbance that the patient will seek advice. The general idea is to correct the difficulty at once by elevating the uterus well in the pelvis to the point D, it being a natural impulse to correct every extreme by going remote from it. But just in proportion as the uterus is lifted above the health line A B, we will have the same effect produced as existed when it was in a state of prolapse, below the line. This is the reason why, after fitting an instrument, the uterus is so often found to have increased instead of being diminished in size. Another result will also be observed, as an effect of obstructing the circulation, namely that the leucorrhœa and discharge from the uterine canal will increase, and an erosion soon form on the cervix where it had not previously existed.

Fig. 40.



The normal or health line.

We have already considered the action of gravity called into play by elevating the hips, and the influence excited by the presence of the atmosphere, in connection with gravity, when the patient is placed on the knees and elbows for the purpose of receiving a vaginal injection. I have been familiar with the action of atmospheric pressure on the vaginal wall since 1854, when I first heard Dr. Sims describe, in a public lecture, the use of his speculum. In the Woman's Hospital, from the very first, we were accustomed, under certain circumstances, to place cases of vesico-vaginal fistula on the knees and elbows to secure greater facility in making the examination and in operating.

For the past ten years I have fully recognized the advantages of this position in the treatment of uterine displacements, and have both practised and taught its use during that time. When treating specially of the subject of retroversion, this matter will be fully considered in connection with a case which I reduced by this method in 1867.

Some years ago I wrote:[1] "It is well, when there is simply a prolapse, to remove the instrument frequently while the patient is quiet, so that the circulation may not be impaired." I often give my patients instructions at night to assume the position on the knees and elbows, after taking out the instrument, and to open with the fingers the outlet of the vagina while in this position, so that the uterus may be carried well up into the pelvis by atmospheric pressure. If the patient is all ready for her bed, a large portion of the air will be retained if she carefully assumes the horizontal position. I have, however, not confined this method to cases of prolapse, but frequently advise a resort to it when the patient is fatigued from exercise, and when wakeful at night.

This mode of treatment is apparently in contradiction to the statement previously made as to the effect obtained from lifting the uterus too high in the pelvis with a pessary. But such is not the case, since the vessels are to a great extent emptied by the pressure of the atmosphere and by gravity. The pressure also is uniform and not confined to a portion of the tissues, as would be the case with an instrument. But more particularly from the natural elasticity of the pelvic tissues there could be no persistent traction exerted on the veins, to compress them, since this same elasticity would soon establish an equilibrium by expelling a sufficient quantity of air from the vagina.

The chief obstacle I met with formerly, in carrying out the plan, was the difficulty frequently found in admitting air to the vagina. This was experienced by almost all women who had not borne children, and with the unmarried or stout women, it was often impossible to open the vaginal outlet by means of the fingers.

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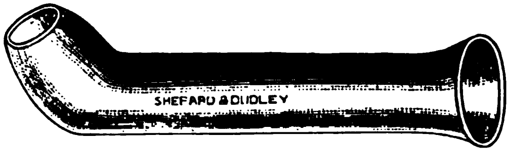
[1] Prolapsus Uteri, its Chief Causes and Treatment, N. Y. Medical Record of April 15, 1871; and Transactions of the N. Y. State Medical Society for 1871.

This difficulty has now been entirely overcome by an instrument (Fig. 41) devised by Prof. Henry F. Campbell, of Augusta, Ga. It consists of a glass tube opened at both ends, slightly bent, with a rounded extremity, which admits of easy introduction of both the instrument and air into the vagina. The device is so simple a one that it is remarkable its use had not suggested itself, since I was familiar with Dr. Sims's former practice of leaving a tube in the vagina, after an examination, for the free passage of air, as the patient changed her position, as otherwise it might escape with a noise as if from the anus.

Fig. 41.



Campbell's "pneumatic repositor"

I use the term "on the knees and elbows" as the one commonly employed in the Woman's Hospital, but it is in effect the same described by Dr. Campbell as the "genu-pectoral position," since the practice has always been to bring the out-spread elbows as well as the chest and side of the face in contact with the table at the same time.

We are now to consider a portion of the subject in regard to which the opinions held are so dissimilar, that there exists no foundation on which a conservative practice could be based in keeping with both extremes.

If the so-called ulceration of the cervix be accepted as a cause and not an effect, the use of caustic applications is a consistent practice, and should be persevered in until the surface has been healed.

But if it be held that the increased secretion is simply an attempt of nature to relieve an obstructed venous circulation, and that the erosion is a surface from which the epithelium has been washed away by the discharge constantly flowing over it, then such a course of treatment is to be deemed not only irrational but most hurtful.

A whole generation of physicians has been misled by the delusion of *chronic inflammation and ulceration* of the uterus, conditions which no one has yet been able to demonstrate on the dead body.

When an erosion has been healed by caustic applications the health of the woman improves rapidly, since, for the time, a great leak has been stopped, by which she was constantly pouring out her life-blood in the form of leucorrhœal discharge. But, as the primary cause is not removed, the erosion must return again and again, until at length, if the treatment be continued, every mucous follicle will have been destroyed, and no further discharge can take place; but the hypertrophy of the uterus and the abnormal condition of the pelvic circulation will remain. If the application be strong enough to produce a slough, then, of course, the mucous follicles will be destroyed; but even if milder means, as the use of the nitrate of silver, be persevered in long enough to heal the surface, the damage will be quite as great, since the tissues will have been rendered sufficiently dense to cause atrophy of these follicles, and after either mode of treatment the tissues become essentially cicatricial in character.

The subsequent effect of such applications to the cervix, is more marked than when made to the canal above the internal os. The cervix is covered, and its canal lined by a highly organized and perfectly formed mucous membrane, so that if its vitality is impaired, reflex symptoms of irritation are made most manifest, with a train of symptoms due to contraction of the os and canal. From the observations of recent writers it is a questionable point if a true mucous membrane, or any lining membrane at all, exists above the internal os, for what seems to be a membrane may simply be an outgrowth from the muscular tissue which is constantly renewed. It is, therefore, irrational to make a caustic application to a surface which cannot long exist in a state of disease, independent of the tissues beneath, and we cannot hope to arrest a discharge until the whole surface has been seared over. As the profession has for years been familiar with the after-effects of the cautery and caustics on mucous membranes in other parts of the body, it is remarkable that their use should still be continued in the treatment of the diseases of the female organs of generation. Yet conscientious men of our day, after the use of the cautery or caustics, will leave a surface on the vagina or cervix to heal by granulation, and will deny that the surface thus formed is cicatricial, or that it ever contracts; and I have no reason to doubt that they think so. but I do impugn the accuracy of their observation, and the wisdom of their measures.

When the surface of the uterine canal has become covered with granulations or vegetations, the actual cautery and the strongest mineral acids may often be applied with impunity, and without injury to the deeper tissues, since they are thus protected; yet the practice, as we shall see hereafter, except for the treatment of malignant disease, is unnecessary, and to be avoided.

We have no means of judging as to the full extent of disease within the uterine canal, or, with accuracy, as to its locality, when situated beyond the range of our vision. The facility for locating its limit exclusively to the cervix, body, or fundus, rests only in the brain of the theorist, and has no existence in practice, yet, in any case, it will be but a question of time before the whole canal becomes equally involved. From our knowledge of the character of the lining membrane of the cervix, we are often warranted in inferring that the cervical portion, near the internal os, is involved when the secretion is profuse, clear, and gleety, and that, when it is less in quantity and consistence, the morbid process is located nearer the fundus. Experience also indicates that, when the discharge is profuse, and there is but little enlargement of the uterus, the disease is located chiefly within the cervix, and will probably readily yield to treatment. While, if the uterus is enlarged, and menstruation disturbed, without reference to the character of the discharge, the case will prove a more tedious one since the whole organ has become involved.

Our remedies for internal use should, therefore, be of a character innocuous to healthy tissue, as we cannot limit their action to the diseased surface exclusively. Since we cannot direct our remedies with accuracy within the uterine canal, or watch their immediate effect by the aid of the eye, our practice must necessarily be somewhat empirical. We will often fail in obtaining the same result from a remedy which had proved most efficacious in a previous case presenting similar features, so far as we possessed the means of discriminating. It may often happen, with all due care, that a diseased surface will remain covered and protected by its viscid secretion, so that an application will reach the more healthy portion of the canal alone. We have only a general rule to guide us in a selection of remedies, which is, that those of a more stimulating character, and astringents, are more useful for diseases confined chiefly to the neck of the uterus, while milder alterations are best adapted for the upper portion of the canal.

The solid nitrate of silver acts with more promptness in healing an erosion, and in arresting a profuse secretion from the cervical canal than any other agent, with the exception of those which are to be classed as caustics proper. It is stimulating, and acts as a powerful astringent to the small bloodvessels within reach of its influence, so that less blood passes to the mucous follicles, and their secretion becomes sufficiently diminished for the erosion to heal. The immediate action, however, of the remedy is to increase the secretion of these glands by a watery discharge, until the vessels have contracted.

The structure of the cervix is naturally more dense than that of the body of the uterus, and it has very few bloodvessels in comparison, but it is covered, as is the vagina, by erectile tissue on which its mucous membrane is chiefly dependent for its vascularity. So long, therefore, as the mucous membrane of the cervix and its canal can properly perform its function, so long will the tissues remain soft, and the induration often detected in the neck will not be found until its mucous follicles or glands have been destroyed or their number greatly lessened.

The continued use of the nitrate of silver is as certain to cause contraction of the os, and to bring about this destruction of the mucous glands as is the application of the cautery, and it has been productive of more harm than the latter, from a want of judgment in its common use. In my practice I cannot count more than half a dozen cases treated by this remedy in a year. It is applicable only when the cervix and body of the uterus are both enlarged and soft, and the os patulous, and giving issue to a profuse cervical discharge. I am, then, tempted to use the agent only when the patient is very anæmic, and it is absolutely necessary that some check should be placed on the discharge without delay. I seldom make more than a single application, and only that when the tissues are unusually soft, as above described. I always apply it with great care, so as not to include the tissues immediately about the os, and I protect this surface by a suitable instrument if the caustic is passed into the canal.

For the cervix, and the canal below the internal os, I frequently use the impure carbolic acid, or creasote-tar, as prepared by Dr. Squibb for commercial purposes. Its action is entirely different from that exerted by the pure carbolic acid, which is essentially a caustic when used undiluted. It is an alterative as well as an astringent, and often exerts a marked local anæsthetic effect. Learning from Dr. Squibb, some seven or eight years ago, that he had observed its anæsthetic effect when used as a dressing to burns, I first applied it to the uterine canal and to the female bladder. Since that time I have used it undiluted; diluted with glycerine, when I wished a milder action; or mixed in equal parts with Churchill's tincture of iodine, to increase its alterative effect. It coagulates thoroughly the albuminous discharges from the uterine canal, but to insure full efficiency, it is always advisable to make two applications, as the first may have been partially neutralized. I have also used as local agents pyroligneous acid, and pure acetic acid, and occasionally creasote alone, or in combination with iodine. When a case proves more obstinate, equal parts of chromic acid and water will be found an efficient remedy, one not now used as much as formerly, since, with other means at command for more general treatment, milder local agents are found to answer in most cases. Water is the proper agent with which to dilute chromic acid, for with glycerine it forms an explosive mixture. As adjuvants, tannin and the pinus Canadensis, alone, or in combination with glycerine, and the balsam of Peru are valuable remedies. A serious objection will be made by the patients to the use of either of the last-named agents, as their linen will become stained by them, unless the greatest care is exercised. This accident can be avoided by the use of a napkin, which I require every patient to wear during the day on which she has received any local treatment. The pinus Canadensis, as furnished to the profession, when first introduced, was a much more efficient remedy than the article now found in the market. For some reason it is now too thin and watery, and I have been obliged to have it carefully reduced by evaporation in a sand bath to the consistency of tar, when it can be used in this condition or diluted with glycerine. Glycerine and iodine will be brought more into use than any other remedies, and are applicable in some form for all varieties of uterine disease. To Dr. Sims we are indebted for the use of glycerine in the treatment of these diseases, and it is a remedy for which we have no substitute. As a solvent or vehicle for other agents it is applicable to a greater extent than any other substance, and as a disinfectant it is also valuable. When placed in the vagina, it provokes, in consequence of its avidity for moisture, a profuse watery discharge, which empties the capillaries without apparently taking more than the serum, or robbing the blood of other constituents, to the detriment of a patient's strength. In fact, an anæmic patient will gain strength from its constant presence in the vagina, although the discharge excited by it may be greater than the previously existing leucorrhœa, and the fact can only be explained on the supposition that the glycerine arrests the escape of the more essential constituents of the blood. The loss of albumen in the leucorrhœal discharge is a very serious one, and when constant, it becomes an important factor in bringing about a condition of anæmia. So if it be the case that the glycerine removes only the watery portions of the blood, and by some action arrests the escape of the albumen and the other component parts, its value as a dressing will be readily conceded. It has, also, the same power as hot water, although in a less degree, of exciting capillary contraction, for any surface which has been long in contact with the glycerine will be found shrivelled and blanched in appearance.

After the examination of every patient I have been in the habit of leaving in the vagina a portion of cotton saturated with glycerine, to which a string is attached, that the patient may be able to remove it in a few hours when it begins to become dry and irritating. Cotton was recommended by Dr. Sims as the vehicle for applying glycerine in this manner, and has been in use for fifteen or eighteen years. Recently I have employed a better material in the form of oakum, which has been prepared for drainage in surgical wounds. I have for years sought a substitute for the cotton, as this substance, in a few hours, will become matted into a ball, although, on its introduction, it may have been spread out with care over the base of the bladder. If the patient should neglect to remove it, after it has gotten into this condition, its presence will often cause a great deal of irritation. A small portion of oakum can be carefully spread out and compressed firmly between the hands, so as to have it not thicker than a few sheets of paper, nor larger than some two and a half inches in length, by a little less in width. For its removal, a short cord or thread can be tied across the middle, but not tight enough to prevent the pad from lying flat. By pouring the glycerine over the oakum, and compressing this with the fingers, it will take up more of the fluid than the same bulk of cotton is able to do. If it be then spread out on the anterior wall of the vagina, it will take up less space than the cotton, and will remain perfectly flat until it is removed. When dry, the oakum feels harsh, and the least fitted substance for the purpose, but if saturated with glycerine it becomes as soft as the finest moistened sponge. For the purpose of drainage, this material is unequalled, while, from being saturated with tar, it is antiseptic, and will remain in the vagina, free from all odor, a much longer time than cotton.

The glycerine should always be of the best quality and purchased from a reliable dealer, for the impure article, used in the arts, is frequently substituted on account of its lower cost, and its use will frequently cause a vaginitis as severe as that produced by gonorrhœa.

Iodine has proved the most valuable of all remedies, and it is one which loses nothing of its efficacy by frequent use. It is not only a local stimulant, by which congestion is relieved, but is likewise a reliable alterative and an efficient exciter of uterine contraction. It acts promptly in causing contraction of all the bloodvessels within range of its influence, and its stimulating effect on the absorbents is well known. Of all remedies applied within the uterine canal, iodine will be taken up into the general circulation the soonest, and it can be detected by the taste in an incredibly short space of time; it therefore acts not only locally but also as a general alterative on nutrition. It is to be applied not merely to the uterine canal but frequently to the whole vaginal surface, and particularly over any region where tenderness can be detected by pressure made with the finger. When applied freely to a surface exposed to the air, iodine will frequently blister, and cause great pain, therefore, some care must be exercised, that it does not come in contact with the outer portion of the vagina. If, by accident, this occurs, the surface can be smeared with glycerine, which will promptly relieve the burning sensation caused by it. The officinal tincture of iodine was long in use for the treatment of uterine disease, but the benefits resulting had been by no means satisfactory or reliable, until the preparation known as Churchill's iodine was employed. To the late Dr. Churchill, of Dublin, we are indebted for this preparation which is a saturated tincture, and about four times as strong as the ordinary one.

Unless the uterus has been previously dilated it will be necessary to use the applicator (see page 30), for the introduction of fluid substances within its canal. A small portion of long-fibre cotton is to be carefully drawn out with the fingers into a triangular form, as thin as possible, and about three inches in length. From one corner of the triangle the cotton should be twisted tight around the applicator, by rolling it in the firm grasp of the fingers. It is then necessary to obtain, by means of the uterine probe, the exact curve and direction of the canal, and this can best be done by placing the patient on the left side, with the cervix brought fully into view. After bending the applicator accurately to the curve indicated by the probe, the cotton is to be dipped into the fluid to be applied, and as the cervix is steadied by a tenaculum held in the other hand, the instrument can be passed to the fundus, the patient being in the same position. The probe should never be introduced into the uterine canal with less care than a surgeon would exercise in exploring the tract of a wound. If the importance of this were more generally appreciated, cellulitis would be a rare occurrence after its use. If a digital examination be first made while the patient lies on the back, the use of the probe becomes valuable to verify the impression conveyed by the finger, as to the position of the uterus. It should then be bent to correspond with the supposed curve of the canal, or direction of the uterus, and introduced with sufficient care to enable the examiner to fully appreciate any deviation. As soon as this is detected or if any obstacle to its passage is felt, the instrument should not be forced, but withdrawn, and the curve altered until it can be passed to the fundus without difficulty. When the probe is manipulated with proper care and patience we will rarely find any obstruction in the uterine canal which cannot be readily overcome after the true direction of the canal has been ascertained.

It is by no means an unimportant point of detail that the applicator should be accurately curved to correspond with the uterine canal. It is, indeed, most essential, as frequently, unless this precaution be taken, profuse bleeding will occur in at least sufficient quantity to entirely neutralize the effect of the remedy applied. Even did no worse result follow the violent introduction of the applicator than suffering on the part of the patient, the greatest care should be exercised, and it will be found after some experience that where local applications are necessary within the womb, they can be made without producing the slightest disturbance.

If it be desirable (and it often is), the cotton may be left in the canal with a portion projecting from the os, as it will cause no disturbance and will be thrown out into the vagina within a few hours. To facilitate the slipping of the cotton from the applicator, it is only necessary, after twisting it on tight, to hold it between the fingers as the flat instrument is turned in the opposite direction. This leaves the cotton loose on the applicator, and, when passed to the fundus, it will generally remain behind as the instrument is withdrawn, but if not, the pressure of the index finger, or of a pair of forceps against the cotton at the external os will be sufficient to disengage it. The advantage of this is twofold: we are able to make a more thorough and lasting application, of iodine for instance, by leaving the remedy longer in contact with the diseased surface, and, at the same time the uterus is stimulated to contraction by the presence of a foreign body within its cavity. This is a convenient method also for the introduction of the dry persulphate of iron, the oxide of zinc, alum, or any other powdered substance employed alternately with the iodine. Before the cotton has been loosened on the applicator, it should be dampened, so that when dipped into the powder, a sufficient quantity may adhere to it. When powdered substances are used it is even more important, for efficiency in the application, to leave the cotton within the canal, than it is when fluids are employed.

As with gleet in the male, so here the pressure or presence of a foreign body in the canal is often of great benefit, not only by lessening the discharge, but by exciting contraction in the organ, and giving more tone to the vessels.

I have found to answer well for this purpose tents made from the pith of a large cornstalk, as recommended by Dr. Goldsmith of Ga., for dilating the canal. The doctor kindly sent me a number of these tents made by himself, but I was disappointed in their limited dilating power. I found afterwards that, as he had only employed the strength of his fingers to compress the pith into tents, the full force of the material was not secured by this mode of preparing it. After the pith had been soaked for several hours in what was boiling water at the beginning, I had the tents prepared after the same method already described for making them of sponge, with the exception that no mucilage was required, in consequence of the different character of the two substances. But they were, in the same manner, compressed on a steel staff by being wrapped as tightly as possible with a cord, then removed, bent to different curves, and left to dry before the cord was taken off. While these tents are, by comparison with compressed sponge, of inferior value for dilating the uterine canal, yet they answer well enough when only a moderate degree of pressure is required for producing an alterative effect on the mucous membrane. The surface being smooth and free from irregular interstices, the mucous membrane does not become abraded from their use as from sponge tents; they entail, therefore, but little risk of blood poisoning. As the pith softens slowly, and, for a time is as unyielding as a sponge tent, it is always prudent for the patient to remain quiet for several hours after its introduction. For the same reason it is more difficult than with a sponge tent to retain the pith tent in the canal, and it is, therefore, necessary to place a compress of oakum or cotton, saturated with glycerine, against the cervix. I have found that dipping a tent of this material into iodine, and then introducing it within the canal, is a very thorough method of applying that agent.

In hospital practice, when I could control the movements of the patient, I have long employed sponge tents to bring about a reduction in the size of an enlarged uterus. This mode of practice was original with me,[1] and from long experience I have found it most satisfactory when employed under proper circumstances. The object is to bring about by pressure an alterative effect in the mucous membrane and indurated tissue, to excite contraction of the whole organ, and to lessen the circulation in the uterus through the profuse watery discharge induced by the presence of this foreign body in the canal.

I cause the bowels to be moved with medicine, or by an enema, on the morning of a clear, bright day, and, if the strength of the patient will admit of it, I direct that she shall remain in the open air for several hours before being seen by me, as she must be confined to the house afterwards for at least two days. A bright, clear day, with the wind from any quarter except from the east, I always select for dilating the uterus, or for performing any serious surgical operation. My reasons for doing so are, in the first place, that under such circumstances I am myself in better condition, but chiefly that the nervous system of a patient will be less taxed, and the power of endurance greater on a clear day. Moreover, experience has taught me that in a state of the atmosphere favorable to an active condition of the skin, there will always be less danger from blood poisoning. I have also been impressed with the conviction that the occurrence of cellulitis is a far more frequent sequel to the use of the sponge tent, when employed during the prevalence of damp, cold, and easterly weather, even when the patient is confined to the house and protected from all exposure.

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[1] See Uterine Surgery, by Dr. J. M. Sims, p. 65.

As I strictly observe the predilection in favor of clear weather and the rules I have already detailed when considering the use of sponge tents, my practice for years has been almost entirely free from any bad consequences attending their use. I introduce as large a tent as possible, without using violence, and, if the canal is not straight, I carefully select a tent of the proper curve. The patient is then placed in bed, as I have described, and a hot water vaginal injection is given, night and morning, and an opiate, if needed. At first, even should there have been no pain, I remove the tent at the end of twenty-four hours, but, after several have been employed, I allow it to remain for thirty-six or forty-eight hours, that the patient may obtain the benefit of the profuse watery discharge which takes place. When I finally remove the tent, I place the patient on her back over a bed-pan, and alongside of my finger I pass the nozzle of a Davidson's syringe to the fundus, and inject a stream of hot water into the cavity, until the organ has contracted on my finger. I then place the patient on the side, introduce the speculum, seize the cervix with a tenaculum, and pack some cotton about it, to receive the excess of iodine, which is to be introduced into the canal. The iodine may be either injected by pressing the nozzle of the syringe to the fundus, or applied by means of the applicator, leaving the saturated cotton within the canal; but it will be necessary to use a larger mass of cotton than would be employed were the canal not dilated.

In all cases it is essential that the patient remain in bed for twenty-four hours after dilating the uterus, and applying the iodine by this method. If the application should be followed by an increase of backache, or any other disturbance, the patient should remain in bed for a longer period of time, and prudence would dictate the necessity of avoiding all over-exertion during a few days longer.

On account of the confinement, and in order that the patient's health may not suffer from it, it is seldom advisable to repeat this mode of treatment oftener than twice during a month, and then to so regulate it that at least an interval of ten days should elapse between the last dilatation and the appearance of the catamenia.

Early in 1863 I injected Churchill's iodine into the dilated uterine canal, with the view ef exciting still more the uterine contraction after the use of sponge tents. I had observed this effect during the previous year that I had been using the remedy, prepared according to the formula now in general use, but which was then procured by Dr. Sims for me from Dr. Churchill. Towards the close of the year, or early in 1864, I injected, at the Woman's Hospital, the dilated uterus of a young woman who had suffered from malarial congestive hypertrophy, when the organ contracted so suddenly, and with such force, as to expel a portion of the iodine from the uterine cavity, entirely out of the vagina, as from a squirt. In this case I was assisted by Dr. John G. Perry, then house surgeon. His predecessor, Dr. G. S. Winston, had also observed with me this effect in the treatment of other cases, but in a less marked degree.[1] No one, previous to myself, had followed this plan of treating hypertrophy of the uterus, nor had any one recognized iodine as an agent for exciting prompt uterine contraction.

The passage of a continuous stream of hot water into the uterine cavity, after thorough dilatation of the canal with the view of causing rapid contraction, and, at the same time, bringing about a modified action in the mucous membrane itself, is a practice I believe to be also original with me.

If the condition of the patient be one justifying the use of sponge tents, and if she be properly situated for receiving this treatment, the effect of hot water will prove most satisfactory in its results.

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[1] Until the publication of Dr. Sims's work on Uterine Surgery, in 1866, I was not aware that any one but myself, unless through my advice, had ever injected the uterus with iodine to arrest hemorrhage. Dr. Sims describes, in his work, this plan as then being the mode of treatment employed by Dr. Savage in the Samaritan Hospital, London.

The direct action of hot water on the interior of the uterine canal is even more beneficial than is its indirect action from the vagina. In connection with the modifying effect of pressure from the tent, and the free application of iodine afterwards, I have found hot water to exercise a more decided action in checking excessive secretion from the mucous glands, than can be gained by the introduction of any remedy into the undilated canal, unless the agent be such as will destroy the character of the mucous membrane, when, of course, all secretion will cease. The good effects of this mode of treatment are not confined to cases of enlargement of the uterus. It is equally beneficial, if not more so, where there exists no enlargement, since the disease is then confined chiefly to the cervix, or at least to that portion of the canal below the internal os. By dilating the canal thoroughly, in these cases, we will open out the rugæ, so that the agent applied can be brought directly in contact with the mouth of each crypt and every portion of the mucous membrane. This cannot be done under ordinary circumstances, and the fact will explain the negative result, frequently observed after applications made through an undilated os, for the nearer the uterus approaches to a natural size, the deeper will these folds be found.

The undilated uterus should never be injected, since the mildest and most unirritating substance thrown into the uterine canal, when in this condition, will often cause a profound degree of collapse, frequently cellulitis, and almost always pain. It has been supposed that the difficulty arose from fluid passing through the Fallopian tubes, and so coming in contact with the peritoneum.

But this explanation is based entirely upon theoretical grounds, for we know in practice that the peritoneum is not so immediately responsive to contact with other substances, although it is true an attack of peritonitis would be likely to follow such an accident. It is not necessary that any portion of the fluid should escape from the uterine cavity in order to produce the most serious consequences. This is proven by a death which occurred a short time since in one of the Western cities, where a woman, in good general health, died instantly with nothing more than a slight convulsive movement, after a small quantity of Churchill's iodine had been injected into the undilated uterine canal. In this case, as I have been informed, the post-mortem examination revealed the important fact that no portion of the iodine had passed into the Fallopian tubes, nor into the uterine sinuses. We will have to seek an explanation in some effect on the nerve centres, by which a reaction from sudden shock is prevented. In our ignorance, we must rest satisfied with the practical fact which has been fully established, that when the canal is sufficiently dilated for the free escape of fluids, it may be injected, not only with impunity, but even with benefit. Of all the various devices which have been conceived for injecting the uterine canal, not one can be used with absolute safety.

My old friend, the late Dr. J. C. Nott, was very expert in injecting the uterus, and devised the best canula in use for the purpose. Some years ago, when the Woman's Hospital was under my charge, Dr. Nott was on duty as an assistant surgeon, and was very anxious to demonstrate the advantages of this mode of treatment. His service consisted of twenty beds, and in one week after going on duty, about fifteen of his patients were down with cellulitis; fortunately none of them died, but several were very ill, and remained in the hospital afterwards for two years or more before they were relieved of the consequences. The doctor had been particularly fortunate in private practice, but this experience led him to abandon the mode of treatment.

Blistering the cervix occasionally will be found a useful adjuvant to other treatment. It is of value when the whole uterus is enlarged, and particularly when the cervix has been indurated. The blister causes a very free watery discharge which relieves the congestion, and at the same time stimulates the organ to contraction. When the cervix has become indurated, the blister is beneficial for its revulsive effect, but it will be of little service should the mucous membrane of the cervix have been destroyed by the long-continued use of nitrate of silver or other caustics. Under these circumstances, we will be obliged to employ a surgical procedure, to be described hereafter.

Some ten years ago, I was in the habit of using vesicating collodion, but abandoned it in consequence of being unable to confine the action of the blister to the cervix. As the cantharides was held in solution by so volatile a substance as the ether, the whole vagina would often become blistered. Shortly afterwards, I found on the market a solution of cantharides in acetic acid, which has answered fully every purpose, since its action can be confined to the most limited space, when so desired.

I have the patient previously prepared by a movement of the bowels, that there may be no necessity to get up for a day or two. In applying the blister, the patient is placed on the left side, and the cervix brought into view by the aid of Sims's speculum. I am in the habit of drawing the cervix a little forward with a tenaculum, and then, with a pair of forceps, packing a small portion of cotton around the cervix, but chiefly below, that the fluid may be prevented from running on to the vaginal surface. The blistering fluid may then be applied with a camel's-hair pencil, or by means of a little cotton twisted around the end of the swab-stick. When a thorough action is required, the blistering fluid can be rubbed over the same surface until it has become of a gray color. It must be allowed a moment or two to dry, when the surface will be found to have become shrivelled, and, for a time, the whole neck will remain reduced in size. The patient is to be kept quiet in bed, the vaginal injections being omitted for three or four days, until the discharge becomes copious. It is seldom that there will be any backache or discharge under twenty-four hours, and, if the patient keeps the horizontal position, the former can be avoided. After the fifth day the parts will heal rapidly under the use of injections, night and morning, of warm (not hot) water to which a little Castile soap has been added. After the morning injection a pledget of oakum, saturated with glycerine, should be laid over the raw surface daily, and removed by a string attached to it, whenever it begins to be uncomfortable. When the whole cervix has been blistered, it is necessary that the patient should remain in bed from four to six days, and, until the discharge ceases, she should not expose herself to the risk of taking cold nor to the dangers of over-exertion.

After this agent has been applied, in the manner described, the epithelium alone is removed from the mucous membrane, and the whole surface is generally healed in seven or eight days, although it may remain, for a few days longer, of a deeper color than natural. When applying the fluid, to prevent its entrance into the canal, a little cotton may be inserted within the os, and, as a precaution, it is especially necessary to do so when the os is much smaller than natural. I have carefully watched the after-effects of this remedy, and I have never seen any evidence of narrowing of the os produced by its use. But it will sometimes cause great pain, and much backache afterwards, if the fluid be allowed to run into a canal with a constricted os. When the discharge is free, and the os well open, I have sometimes intentionally applied the fluid to the lining membrane of the canal to bring about an alterative effect in the mucous glands, sometimes, as I have thought, with a result decidedly beneficial, but its use, in this manner, was always attended with more pain than when applied to the cervix alone.

There are certain practical points which should never be lost sight of in connection with the local treatment, to which I shall again call the attention of the reader. We should have the fear of cellulitis always before us, in the treatment of these diseases, and as common as this complication is from cold and other causes, it has its origin quite as frequently in carelessness on the part of the practitioner.

We should never introduce the probe, a sponge tent, or make an application within the uterine cavity, if the slightest indication of cellulitis can be detected. Nor should we attempt to correct a displacement of the uterus, if cellulitis exists, or as long as any tenderness, attributable to inflammatory origin, can be detected on pressure by means of the finger. But we must discriminate between a condition of hyperæsthesia, to be found in anæmic and hysterical women, and one of inflammation, since an error of diagnosis, although, on the one hand, resulting merely in a loss of time, may, on the other, result in a loss of the patient. It is, therefore, better in all cases of doubt to give the patient the benefit of some preparatory treatment.

After an application to the uterine cavity, rest, for a time, in the horizontal position is always advisable, and this precaution is particularly to be observed when an application is made for the first time. It is equally prudent to observe the same precaution after replacing the uterus for the first time; and, when there has been much pain produced, or difficulty experienced in the reduction, I generally insist upon the patient remaining in bed until all danger has passed. In my private hospital the rule is for every patient to lie down after any application to the uterine canal, to have some covering thrown over them, and heat applied to the feet if they should be cold. In my office practice, I often retain outside patients for hours as a matter of prudence, and, when advisable to do so, I keep them until next day or longer. When an operation has been performed or an application has been made to the uterus, of sufficient severity to make it prudent that the patient should remain in bed, she is not allowed to assume the upright position, but is lifted into bed after the sheets have been warmed, and a vessel of hot water placed for her feet. As long as we are able to keep the feet warm, danger from cellulitis will be slight. A patient is never to be allowed to put her feet out of bed as long as it is necessary that she should remain there. If she should be unable to empty the bladder on a bed pan, the catheter must be resorted to. To this imprudent act of getting out of bed, so commonly committed by women, without thought of the consequence, may be traced many an attack of cellulitis, brought on by the sudden, although momentary (it may be), exposure of the feet to cold. It has caused more disease in women who were previously healthy, than could result from any other single act of imprudence, within their power to commit, and, to my knowledge, several deaths have occurred from pelvic abscesses where patients have disregarded the precautions enjoined, when under treatment for previous diseases.

However trivial or unnecessary these details may seem to be, their importance is not exaggerated, for experience has taught me that in the observance of every precaution lies the secret of immunity and success.

Before closing this portion of our subject, let us recapitulate briefly the principles which are to govern us in the use of local means for the treatment of these diseases. Our chief purpose is to be directed to giving tone to the pelvic vessels, and to placing the uterus in a position where the circulation will be the least obstructed. The first is to be accomplished by the frequent use of hot water injections, given in a favorable position, by which the vessels will be more contracted after they have been somewhat emptied of their contents by the action of gravity. The second is to be gained by a properly constructed pessary to suit the individual peculiarities of the case. Pessaries, however, should never be employed while cellulitis exists, or when the position or condition of the uterus indicates the necessity for preparatory treatment, there being a proper time and mode of applying pessaries to advantage, the same as there is for splints in the treatment of a fracture. All our other local remedies are to be employed as aids in carrying out the same principles, by which increase in size is to be reduced, and augmented secretion diminished by improvement in nutrition, and a restoration of the equilibrium of the circulation. Withal, we must carefully discriminate between cause and effect, and bear in mind that, as a rule, the local condition is but an expression of the state of the whole body. Therefore, the local condition is not likely to be permanently benefited, unless we can at the same time improve general nutrition, by a careful and well regulated constitutional treatment.

The female organs of generation have been mercifully endowed with a degree of tolerance to injury not possessed by the male, and woman is thus protected that she may be able to bear the perils of gestation. But few, however, of the many physicians who undertake to treat these diseases fully realize that there is naturally a limit to this immunity. No portion of the body has suffered more in consequence of incapacity on the part of members of the profession, many of whom, from ignorance, have been unable to appreciate in detail the true bearing of all pertinent points. Nor have women suffered much less from the gross carelessness of some, in not making a thorough investigation, even when they may have possessed the requisite knowledge. Under the guise of surgery, the uterus has been subjected to a degree of mal-practice, which would not have been tolerated in any other portion of the body. Its cavity has been, and is still made the receptacle for agents so destructive, that no conscientious man would employ them for the treatment of disease in any other cavity of the body without a full appreciation of his responsibility. But I trust that we have already passed the heroic age, and that in the treatment of these diseases, we may be governed hereafter by the same rational principles as would be applicable elsewhere, that we may simply, as we term it in this country, exercise our "common sense."

CHAPTER IX.

OVULATION AND MENSTRUATION.

Nerve supply of the ovaries—Puberty—The uterus not the dominant organ of the female—Menstruation not always due to ovulation—Disintegration of the lining membrane of the uterus during menstruation—Causes which determine early or late menstruation—Table I., showing age at first menstruation, for single, sterile, and fruitful women; and whether menstruation was regular or not—Table II., showing the percentage on the whole number menstruating at a given age—Table III., showing the percentage in relation to regularity or irregularity—Table IV., regularity further analyzed—Table V., pain during menstruation in reference to health, disease, and sterility—Table VI., showing proportion suffering pain with menstruation for each menstrual age—Table VII., showing further relation of pain to menstruation—Table VIII., pain during menstruation for all conditions—Table IX., showing average duration of the flow—Table X., showing duration of flow with reference to circumstances of first menstruation—Table XI., changes in duration of flow in after-life—Table XII., menstrual changes as to quantity and duration.

The ovaries are supplied with nerves from the solar plexus, forming a part of the great ganglionic, or sympathetic system, and the nutritive functions are under the same influence.

At a certain age, a stimulus is given to the nutritive functions through the influence excited by the ovaries, which results in a rapid physical growth of the female. When the ovaries have reached their full development, the transition from girlhood to womanhood takes place at the period termed puberty. The expression of this climax is noted, in a properly organized condition, by a discharge of blood from the uterine canal. This discharge of blood is called the menstrual flow, which returns at regular intervals, until a certain period of middle life, when the ovaries become atrophied and cease to exercise any further influence.

During the menstrual life, the ovarian influence is, in health, the dominant power. Through the aid of the sympathetic system, it exercises as important a part in the organization as the fly-wheel, or governor, in regulating the power and speed of a well-constructed engine.

The ovaries are the egg-bearing organs of the female. The eggs, germs, or ova, exist in large numbers in each ovary, being contained in ovisacs called the Graafian follicles. As maturation progresses, the ovisac, or follicle, becomes more vascular, and enlarges by the accumulation of a serous fluid within its cavity. In this way it approaches and finally projects upon the surface of the ovary. At the proper time, it ruptures, when the ovum escapes and is seized by the fimbriated extremity of the oviduct, or Fallopian tube, and carried along this canal into the uterine cavity, where it becomes impregnated under favoring circumstances.

It was formerly believed that the uterus exercised at all times, during menstrual life, the greater influence in the female economy, but further investigation has shown that this and the other organs of generation are, under ordinary circumstances, but appendages, as it were, to the ovaries. During pregnancy, however, the force of the uterus becomes paramount, and that of the ovaries rests, for the time, quiescent. It is a fact well known that the ovaries are not unfrequently found fully developed when the uterus and vagina are wanting, but that the uterus never reaches its full size if the growth of the ovaries is deficient. Again, if from any cause, in after life, atrophy of both ovaries should take place, by which their function become impaired, the uterus also decreases in size, and its office ceases.

The view is still held by many that the menstrual flow is always due to ovulation, but recent observations indicate that this is not correct. The subject is still one of great obscurity, from the difficulty of observation in the human female, and if ever settled it will probably be by the study of the function as performed in other animals that are nearest allied to the human species.

One point is settled beyond question, that the first menstrual flow is dependent on the final and complete development of the ovary. In other words, menstrual life never begins until the ovaries have been developed, so far as the vital forces of the individual will admit, to a full physiological standard.

There exists, frequently, a coincidence between ovulation and the occurrence of the menstrual flow. But it is claimed that this flow frequently takes place without the rupture of a Graafian vesicle, while ova are developed in the earliest infancy, during lactation, and even in after life, when the menstrual flow has ceased. Instances are not rare where conception has taken place before the menstrual flow has ever appeared, and consecutive pregnancies are known to have occurred in the absence of the catamenia. I have, myself, met with one instance in which the woman had borne two children before her first menstrual period, at eighteen years of age. I have had also, under my care, three cases in which conception occurred during the prolonged absence of the menstrual flow, after a previous pregnancy; of these, one miscarried, and two went to full term. It has even been noted that ovulation occurs sometimes during the existence of pregnancy.

We are ignorant of the length of time necessary for the ovum to reach the uterus after it has once entered the Fallopian tube. But the ovum either possesses a remarkable degree of vitality, or it does not reach the cavity of the uterus before the flow takes place. For it is a fact well attested that conception may occur at any time during the interval between the flow, although, as a rule, it takes place shortly after menstruation has ceased. The inference is a fair one, that impregnation is frequently effected before menstruation begins, or that the ovum does not enter the uterine cavity until the flow has ceased. We cannot otherwise explain the fruitfulness so common among the Hebrews. I have been informed by some of my patients of this faith that a woman is considered unclean for five days before the period, and for a week after the flow has ceased, and that the law is religiously observed in having no intercourse with their husbands during this interval. I am without the necessary data to prove the assertion, but am under the impression that the average duration of the menstrual flow is rather longer for women of this race than for those of our own people. I had been informed of the general observance of the law, and a knowledge of it led me to make some inquiry in a case which I now recall. This was a lady whose flow had always lasted a week; she was the mother of a large number of children. She came under my care for excessive menstruation, which was then prolonged to ten days. She assured me that she scrupulously observed the law of her people, and yet she became pregnant twice, to my knowedge, during the six days only which remained in the month. She became pregnant, therefore, between the seventeenth and twenty-third days, after the beginning of one period, or between the eleventh and twenty-fifth day, before the next one began.

The connection between occurrence of ovulation and the menstrual flow has recently been investigated by Slaviansky and others. As the result of their observations, it is shown that the two processes are distinct after puberty; a further consideration of this subject is not within the purview of this work, but the study of certain changes in the mucous membrane of the uterine canal, which, it is held, take place during the menstrual flow, is of the greatest practical importance.

The late Dr. Tyler Smith was, I believe, the first to call attention to the disintegration, or throwing off, of the mucous membrane from the canal at the time of menstruation. His observations were limited; but in one instance, where the female had died during the flow, he was aided in the examination by Mr. Handfield Jones, and not a trace of the epithelium or utricular glands could be detected by aid of the microscope. That this change does take place has been confirmed by the more recent observations of Drs. Farre, Williams, and Aveling, of England. Dr. Barnsfather, of Cincinnati, has also presented the result of his investigations into the microscopic appearances of the menstrual blood. He states that in every instance under observation, exfoliation of the mucous membrane took place, even from those in health. Dr. Engelman,[1] of St. Louis, on the contrary, claims that the mucous membrane becomes only thickened with the menstrual congestion, and regains its natural condition when the flow ceases.

Dr. Williams[2] regards the menstrual flow as a process not complete in itself, but only the last stage in a cycle which begins at the cessation of one menstrual epoch, and, passing through the "developmental changes" of the lining membrane of the uterus, ends with the close of the following period. That there is no interval of uterine rest, but that the nearest approach to this condition is during the bleeding, when the mucous membrane is undergoing fatty degeneration and disintegration. Even while the membrane is yet being thrown off, the subjacent muscular wall is in a state of active preparation for the formation of a new mucous membrane, so that there is, strictly speaking, no such thing as a period of uterine inactivity. The lining membrane of the uterine cavity is generally thrown off cell by cell, the process beginning always just within the internal os, gradually extending to the fundus, and at the same time towards the muscular wall. This process is completed, with many, in three or four days, but with some, seven or eight days are necessary before the whole membrane is removed. The disintegration not only affects the tissues about the bloodvessels, but the coats of the vessels also, so that these are opened, and hemorrhage takes place from them. This, he states, is

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[1] American Journal of Obstetrics, May, 1875.

[2] On the Structure of the Mucous Membrane of the Uterus, and its Periodical Changes. By John Williams, M.D., etc. Obstetrical Journal of Great Britain and Ireland, March, 1875.

Aveling's "denidation." It is also claimed that while this destructive process is going on, active proliferation is taking place in the muscular tissue beneath the mucous membrane as it is thrown off. That the formation of the new membrane also begins immediately within the inner orifice, advances towards the fundus, and is completed at the end of a week. It is affirmed that this membrane is formed from the wall of the uterus, there being no cellular or submucous tissue, its "muscular fibres producing the fusiform cells, the connective tissue the round cells, and the groups of round cells, in the meshes formed by the muscular bundles, the granular epithelium." The whole membrane is found lined by columnar epithelium at the end of a week, by extension, it is supposed, from the epithelial lining of the cervix; and, probably, the epithelium of the tubular glands of the body contribute also to its formation. "An abrupt distinction between the mucous membrane and the muscular wall appears first near the cervix, about the tenth day after the cessation of the catamenial flow, and it gradually extends towards the fundus, which is reached a little before the bleeding time. At this time, the membrane has reached the highest degree of development attainable by it in the unimpregnated uterus, and is in a fit condition to receive the impregnated ovum." This stage he designates as Aveling's "nidation." He claims that "menstruation, then, is neither congestion nor a species of erection, but a molecular disintegration of the mucous membrane of the body of the uterus, followed by hemorrhage." The increased flow of blood to the uterus "is determined, then, by the active processes going on in the organ, and is in no way allied to congestion." The maximum is reached just before the menstrual flow appears. "When fatty degeneration sets in the flow is suddenly reduced, when proliferation sets in actively again, the blood supply is increased, and continues gradually to be increased until the membrane has attained its full development, when the supply is again suddenly diminished, and the changes described take place, unless conception shall have occurred."

Dr. Aveling[1] defines "Nidation" to be the periodical formation of the membrane lining the body of the uterus, which is developed during the inter-menstrual period. He states "without an ovary, there can be no reproductive life, and without this life there can be no nidation. So far, therefore, nidation is dependent upon ovulation for its being. Sexual life, however, once established, the existence and periodicity of nidation proceeds with an independence and individuality, the actuality of which is little appreciated." "Nidation has been likened to gestation. Denidation may be compared with parturition. The nidal decidua having reached its full development, and no impregnated ovum having arrived to demand from it protection and sustenance, a process of degeneration takes place, its attachments are loosened, and it is expelled by the contractions of the uterus, sometimes wholly in the shape of a triangular sac, but more frequently in minute portions. How long this process occupies, has not been determined, but it is probably completed during the menstrual period." "The act of denidation probably determines that of menstruation, because it is from the denuded surface of the uterus, caused by the removal of the nidal decidua, that the menstrual flow comes." "The process of denidation is doubtless very much assisted by that of menstruation. By the menstrual flow, the débris of the nidal decidua is floated and washed out of the uterus and vagina, and in this way the denidal act is rendered more prompt and effective."

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[1] On Nidation in the Human Female, by J. H. Aveling, M.D., etc., Obstetrical Journal of Great Britain and Ireland, July, 1874.

Dr. Engelmann, in his paper already referred to, differs in opinion, and claims the deductions drawn by Dr. Williams are not always correct, since his observations were confined to the examination of the uteri of those who had died from diseases which may possibly have affected the condition of the uterus. Dr. Williams, in a subsequent article,[1] states, "The theoretical objections to the view that the so-called mucous membrane of the uterus is renewed by proliferation of the superficial laminæ of the muscular wall, is based on the fallacy of regarding that wall as a muscle pure and simple. I have pointed out in this paper that it is much more, that it is indeed part of the mucous membrane itself, and that the terms muscular wall and mucous membrane, as they are generally applied to the uterus, are misnomers." He also contends that the objections of Dr. Engelmann are not well taken, since his observations were not made in any case where the female had died during the menstrual period.

This subject is yet far from being settled, but its importance merits the fullest consideration. These investigations lead in the right direction, and by further observation are destined to throw light on many obscure points in the pathology and treatment of uterine disease.

Dr. Tilt[2] has tabulated the results of observation in different parts of the world, to show the age of first menstruation for some 12,521 women. At Calcutta the average is shown to be 12.49; for Copenhagen, 16.88; and for 5218 English women, given in this table, from different observers, the average was 14.92 years. It is stated by the same author, on the authority of Dr. McDiarmid, who accompanied the Arctic Expedition under Ross, that puberty with the Esquimaux is frequently delayed until the age of 23, and with many afterwards only a slight show occurs during the short summer. The weight of evidence set forth in this table is conclusive in showing the influence of climate in hastening or retarding puberty. But my own impression is that the habits of race, through which the nervous system is influenced, are the most important factors in determining the time of puberty, and that climate, in itself, has but little influence. Privation, and a want of physical growth, as a rule retard the first appearance of menstruation, while an undue development of the nervous element always hastens puberty. Civilization, in connection with a luxurious mode of living, undoubtedly hastens this period, and it will be found that the women of the cities menstruate somewhat earlier than those living in the country with more simple habits of life.

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[1] The Mucous Membrane of the Body of the Uterus, Obstetrical Journal of Great Britain and Ireland, Nov. 1875.

[2] On Uterine and Ovarian Inflammation, etc., by Edward G. Tilt, M.D., p. 41.

More than half of the women who have been under my observation menstruated for the first time during the season of four months, between the beginning of April and the end of July. The explanation offered is that the organs of generation are in a more active state at this period of the year than at any other.

In Table I. I have given the age at first menstruation for two thousand three hundred and thirty women treated by me in private practice. They were from the better classes, nearly all natives of the country, and from every portion of the United States. With the advantage of so intelligent a class, I have been able to obtain accurate information on a variety of points which will be presented in a statistical form. I have unfortunately not obtained the same information from all, so that the number of cases will vary somewhat in the different tables. This has been due to inadvertence in recording the cases, or from the patient being unable to give the required information with accuracy, and where any doubt has existed the case has been excluded. When a patient has menstruated for the first time before or after the half year, I have placed the age for puberty at the nearest complete year, and to test the accuracy of this plan, I have added together with the even year the additional odd month for several hundred cases. For so large a number the result has been the same for all practical purposes, and as but a slight difference was found between the average obtained by either method, the plan followed was adopted as a saving of labor.

TABLE I.—*Regularity of Menstruation.*

Age at first menstruation	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	23.	Total number.	Average age of menstruation.	Average for each condition.
Unmarried—																
Regular from the first	1	7	21	55	85	43	35	11	2	2	..	..	..	262	14.16	
" afterwards	..	6	8	16	18	11	9	7	5	1	.	..	..	81	14.31	
" never......	2	1	12	9	14	8	7	8	3	2	..	..	..	66	14.36	
Total............	3	14	41	80	117	62	51	26	10	5	..	..	..	409	....	14.21
Sterile—																
Regular from the first	3	11	46	101	109	68	50	33	5	6	..	..	..	432	14.18	
" afterwards	2	7	20	30	26	21	22	8	4	4	..	..	..	144	14.18	
" never......	..	1	6	13	15	15	8	5	5	..	..	..	1	69	14.68	
Total............	5	19	72	144	150	104	80	46	14	10	.	..	1	645	....	14.23
Fruitful—																
Regular from the first	8	33	124	161	235	174	121	70	24	3	2	1	.	976	14.22	
" afterwards	3	11	32	42	49	40	23	21	11	2	1	.	..	235	14.24	
" never......	..	4	5	10	20	6	13	5	2	..	..	..	.	65	14.35	
Total............	11	48	161	213	324	220	157	96	37	5	3	1	..	1276	....	14.23
Total on all women—																
Regular from the first	12	51	191	317	449	285	206	114	31	11	2	1	..	1670	14.20	
" afterwards	5	24	60	88	93	72	54	36	20	7	1	..	.	460	14.23	
" never......	2	6	23	32	49	29	28	18	10	2	..	..	1	200	14.42	
Total............	19	81	274	437	591	386	288	168	61	20	3	1	1	2330	....	14.23

The average age at first menstruation, as given in the above table, for all women is 14.23 years. It will be noted that there existed no material difference between the average given for the unmarried, sterile, or fruitful. But on comparing these results with those given in Table VIII., where the relation of puberty to regularity and pain of menstruation is shown, a slight discrepancy will be detected. This is due to the fact that a number of cases which were chiefly surgical in character, were included in Table I., and excluded by accident from the other. The average as shown in Table VIII. for the unmarried is nearly the same. But the sterile were found to have first menstruated at a little earlier period, and the fruitful about twenty-six days sooner than the average given above. With this explanation, we may accept the average of 14.14 years as the proper one for those women who suffered in after life from uterine disease, while a mean between the two averages would be 14.18, or fourteen years and sixty-five days.

The earliest age at which puberty has occurred under my observation has been ten years, and the latest twenty-three years. By reference to Table I., it will be seen that nineteen females menstruated for the first time at this early age. That the flow was not an accidental bleeding is shown by twelve of these having remained regular from that time, and five became so within a year, while the remaining two cases were never regular. The connection between the age of puberty and childbearing will be referred to hereafter. As a curious circumstance, however, I may state that the eleven fruitful women who menstruated for the first time at ten years of age were impregnated fifty-nine times, and that the average number of children borne by these was greater than for those who commenced to menstruate at any other year, while their average age of marriage was 18.25 years. The ages of ten and nineteen bear the closest relation to each other in reference to first menstruations, and are almost the extremes, since the table shows that the likelihood of development after the latter age is very small, giving but three instances of puberty at twenty, and but one each for the age of twenty-one and twenty-three years.

TABLE II.—*Average Menstrual Age.*

Age at first menstruation.....	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	23.	Total.
Unmarried........	3	14	41	80	117	62	51	26	10	5	..	..	..	409
Percentage	0.71	3.43	10.03	19.57	28.61	15.15	12.47	6.35	2.44	1.22				
Sterile............	5	19	72	144	150	104	80	46	14	10	..	..	1	645
Percentage	0.77	2.94	11.16	22.32	23.25	16.12	12.40	7.13	2.17	1.55	..	..	0.15	
Fruitful..........	11	48	161	213	324	220	157	96	37	5	3	1	..	1276
Percentage	0.86	3.76	12.61	16.69	25.39	17.24	12.30	7.52	2.89	0.39	0.23	0.07		
Total for each year	19	81	274	437	591	383	288	166	61	20	3	1	1	2330
Percentage	0.81	3.47	11.76	18.76	25.36	16.56	12.36	7.21	2.61	0.85	0.12	0.04	0.04	

In Table II. is given the proportion of unmarried, sterile, and fruitful women, and also the percentage on the total number of those who menstruated for the first time at any given age.

The proportion menstruating for the first time at fourteen, the nearest even age to the general average, is 25.36 of the total number. Of those first menstruating below fourteen years of age, the number of sterile women, in proportion to the whole number of sterile, was greater by three per cent. than the number of fruitful to their whole number; due to the fact that the number of sterile women menstruating at thirteen was nearly as great as at fourteen years of age. Above the age of fourteen there existed but little difference in the relative proportion of sterile and fruitful women who developed late.

TABLE III.—*Regularity of Menstruation.*

	Unmarried.	Sterile.	Fruitful.	Total.
Regular from the first	271	453	1046	1770
Percentage	64.37	67.51	77.19	72.33
Regular afterwards	81	145	237	463
Percentage	19.23	21.60	17.49	18.92
Never regular	69	73	72	214
Percentage	16.38	10.88	5.31	8.74
Total	421	671	1355	2447
Percentage	17.20	27.42	55.37	

REGULARITY OF MENSTRUATION.—It is shown by Table III. that of two thousand four hundred and forty seven women 72.33 per cent. were regular from the beginning, 18.92 per cent. were regular after a certain time, and 8.74 per cent. were never regular.

The average length of time for all before becoming regular was about eighteen months and three days after the first appearance of menstruation.

This table shows the influence of marriage in bringing about regularity of the menstrual flow, since the proportion of the sterile who were never regular, is smaller than that for the unmarried women. It shows, also, the effect of pregnancy as being even more decided, since a large proportion of the fruitful women could only have become regular after child-birth.

The total number in Table III. is made up of those under my care of whom I had a complete record. This number, with the relative proportion there given, of the unmarried, sterile, and fruitful women, will be used hereafter as the standard for comparison as to the liability of either class to any special disease.

There is given in Table IV., for each year of first menstruation, the proportion of those who were regular from the first show, those regu-

TABLE IV.—*Regularity of Menstruation as to Age.*

Menstrual age …	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	23.	Total.
Regular from the first…………	12	51	191	317	449	285	206	114	31	11	2	1	..	1670
Percentage..	0.71	3.05	11.40	18.98	26.88	17.06	12.33	6.82	1.85	0.65	0.12	0.06	..	71.26
Regular afterwards…………	5	24	60	88	93	72	54	36	20	7	1	..	..	469
Percentage..	1.08	5.21	13.04	19.13	20.21	15.65	11.73	7.82	4.34	1.52	0.21	..	..	19.71
Never regular…	2	6	23	32	49	29	28	18	10	2	..	..	1	200
Percentage..	1.00	3.00	11.50	16.00	24.50	14.50	14.00	9.00	5.00	1.00	..	..	0.50	8.59
Total for each year…………	19	81	274	437	591	386	288	168	61	20	3	1	1	2330

lar after a certain time, and those who were never regular. This Table is of more interest as a part of the history of menstruation than for any practical deduction to be drawn from it other than of a negative character. It shows, with but a variation of two or three per cent., that about the same proportion are regular or irregular for any one year. The proportion of those who were regular and menstruated for the first time, either above or below the average age of puberty, is about the same; and the same is true of those who became regular afterwards. But for the class who were never regular, the proportion is 12.50 per cent. greater for those menstruating above the average age of puberty than below it, showing that a larger proportion of those who were never regular menstruated for the first time late, or above the average age.

It is indicated by Table V. that in a state of health, menstruation should be free from pain. We shall see hereafter that pain, in the

TABLE V.—*Condition of Pain during Menstruation.*

NUMBER OF CASES. (*With percentage of each condition.*)	Unmarried.	Sterile.	Fruitful.	Total.
With pain in the beginning of the flow	57	135	105	297
Percentage	19.19	45.45	35.35	13.63
With pain during the flow	84	151	59	294
Percentage	28.57	51.36	20.06	13.49
Free from pain	209	311	1067	1587
Percentage	13.17	19.59	67.23	72.90
Total	350	597	1231	2178

beginning of the flow, at puberty is not, as a rule, a symptom of disease but of a form of congenital flexure of the uterine neck.

We may assume, therefore, from a total of two thousand one hundred and seventy eight women, that but 13.49 per cent. gave indication at puberty of a condition which, in after life, would render the individuals more liable to disease. We shall see when considering the different forms of flexures, that the character of the pain at this period of life is sometimes an indication of a condition which may necessitate a resort to local treatment, even at so early an age. I cannot now enter on this subject at greater length without repetition hereafter. But I would call the attention of the reader to the fact, pointed out by Table V., that more than half of all the women, who at puberty suffered pain during the flow, were sterile in after life. If we exclude the unmarried (since we cannot know the proportion of those who would be sterile), we will find that of all married women, who at puberty suffered pain during the flow, over 71 per cent. were sterile.

Table VI. is intended to give the proportion of cases with pain, at the beginning of and during the flow, and those free from it, for each menstrual age, in connection with regularity; and the averages are taken on the total number of each condition as to regularity.

Table VII. also gives the proportion who suffered pain, or who were free from it, in connection with the degree of regularity, but the averages are taken on the total number menstruating for each year, and not on the whole number under observation.

These tables seem to indicate that menstruation, when the flow is regular, is less painful when the development occurs after fourteen than when it takes place before that age. But for those who were never regular, a larger proportion suffered when puberty took place after the average age. Without reference to regularity, it is shown in Table VII., by the percentages for each menstrual year, that the proportion of those who were free from pain is decidedly greater when puberty took place above the average age. Over seventy-five per cent. of all the women (see Table VII.) were regular and free from pain, while fifteen per cent. more suffered from pain, who were never regular.

When pain existed only at the beginning of the flow, it is indicated by Table VIII., that all women menstruate for the first time at an earlier age than under any other condition. Those who were free from pain developed a little later in life, and where the dysmenorrhœa continued during the period, puberty was delayed about a month

TABLE VI.—*Condition of Menstruation as to Pain, if any, at the beginning of or during the Flow.*

Age at first menstruation	10.			11.			12.			13.			14.			15.		
Time of menstruation when pain was felt.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.
Regular from the first............	2	....	8	10	7	29	23	20	151	44	44	227	67	53	348	31	34	197
Percentage	00 90	....	00.65	4.78	3.60	2.35	11.00	10.30	12 27	21.05	22.68	18.45	32.05	27.31	28.29	14.82	17.52	16.01
Regular afterwards..............	....	....	3	4	2	11	6	6	40	16	11	44	11	14	38	6	12	33
Percentage	....	....	1.26	7.54	3.50	4.62	11.32	10.54	16.80	30.18	19.29	18.48	20.75	24.56	15.88	11.32	21.05	13.86
Never regular	1	....	2	....	2	6	3	5	13	7	9	15	10	10	26	6	5	18
Percentage	2.84	....	1.68	....	4.64	5.04	8.57	11.62	10.92	20.00	20.93	12.60	28.57	23.30	21.84	17.14	11.62	15.12
Total number for each age.......	16			71			267			417			577			342		
Percentage for each age...... ...	0.73			3.26			12.26			19.15			26.46			15.71		

Age at first menstruation	16.			17.			18.			19.			20.	21.	23.	For all ages.			
Time of menstruation when pain was felt.	Beginning.	During.	No pain.	Beginning.	During	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	No pain.	No pain.	No pain.	Beginning.	During	No pain.	Total.
Regular from the first............	21	19	147	8	12	87	1	4	26	2	1	8	2	....	....	209	194	1230	1633
Percentage	10.04	9.75	11.95	3.82	6.18	7.07	00.47	2.06	2.11	00.90	00.51	00.65	00.16	....	....				
Regular afterwards..............	4	6	26	6	2	23	....	3	11	....	1	7	1	1	....	53	57	238	348
Percentage	7.54	10.59	10.92	11.32	3.50	9.66	....	5.26	4.62	....	1.75	2.94	00.42	00.42	....				
Never regular	4	2	24	3	5	8	1	4	4	....	1	2	....	....	1	35	43	119	197
Percentage	11.42	4.64	20.16	8.57	11.62	6.72	2.84	9.30	3.36	....	2.32	1.68	....	....	00.87				
Total number for each age.......	253			154			54			22			3	1	1	297	294	1587	2178
Percentage for each age	11 62			7.07			2.48			1.01			0.14	0.05	0.0				

TABLE VII.—*Condition of Menstruation as to Pain, etc.*

Age at first menstruation	10.			11.			12.			13.			14.			15.		
Time of menstruation when pain was felt.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.
Unmarried—																		
Regular from the first	1	..	1	2	1	3	4	6	13	6	7	35	15	14	49	3	12	18
Regular afterwards	..	..	..	2	2	..	..	3	4	2	4	7	2	7	2	1	3	3
Never regular	..	..	1	..	1	1	1	2	5	1	1	5	1	3	6	4	..	6
Sterile—																		
Regular from the first	1	..	2	4	2	6	5	12	24	24	28	53	31	28	53	17	15	42
Regular afterwards	..	..	1	1	..	2	3	3	6	8	4	9	5	4	7	1	5	7
Never regular	..	..	1	..	1	..	2	1	4	4	5	5	6	4	6	1	4	6
Fruitful—																		
Regular from the first	..	..	5	4	4	20	14	2	114	14	9	139	21	11	246	11	7	137
Regular afterwards	..	..	2	1	..	9	3	..	30	6	3	28	4	3	29	4	4	23
Never regular	1	..	..	..	..	5	..	2	4	2	3	5	3	3	14	1	1	6
Summary—																		
Regular from the first	2	..	8	10	7	29	23	20	151	44	44	227	67	53	348	31	34	197
Percentage	20.00	..	80.00	21.74	15.21	63.04	11.85	10.31	77.83	13.96	13.96	72.03	14.31	11.30	74.35	11.83	12.97	75.11
Regular afterwards	..	..	3	4	2	11	6	6	40	16	11	44	11	14	38	6	12	33
Percentage	..	..	100.00	23.52	11.76	64.70	11.53	11.53	76.72	22.53	15.49	61.97	17.46	22.22	60.31	11.76	23.53	64.70
Never regular	1	..	2	..	2	6	3	5	13	7	9	15	10	10	26	6	5	18
Percentage	33.33	..	66.66	..	25.00	75.00	14.28	23.81	61.90	22.58	29.03	48.38	21.78	21.78	56.52	20,68	17.24	62.06
Total as to condition	3	..	13	14	11	46	32	31	204	67	64	286	88	77	412	43	51	248
Percentage	18.75	..	81.25	19.72	15.49	64.79	11.98	11.61	76.40	16.06	15.35	68.58	15.28	13.37	71.35	12.57	14.91	72.51
Totals for each menstrual year	16			71			267			417			577			342		

TABLE VII.—*Continued.*

Age at first menstruation	16.			17.			18.			19.			20.	21.	23.	For all ages.				
Condition as to pain, etc.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	No pain.	No pain.	No pain.	Beginning.	During.	No pain.	Total.	Percentage.
Unmarried—																				
Regular from the first..........	4	4	21	2	6	7	..	1	3	..	..	2	..	..	..	37	51	152	240	68.60
Regular afterwards............	..	3	4	3	1	2	..	2	1	..	..	1	..	..	..	10	25	24	59	16.85
Never regular	1	..	3	1	1	3	1	..	1	..	.	2	..	..	..	10	8	33	51	14.57
																			350	
Sterile—																				
Regular from the first..........	10	14	27	3	5	23	1	2	2	2	1	3	..	..	..	98	107	235	440	73.70
Regular afterwards............	2	3	9	1	1	3	..	..	..	..	1	1	..	..	..	21	21	45	87	14.57
Never regular	2	2	4	1	2	2	..	3	2	..	1	..	..	..	1	16	23	31	70	11.72
																			597	
Fruitful—																				
Regular from the first	7	1	99	3	1	57	..	1	21	..	..	3	2	..	..	74	36	843	953	77.32
Regular afterwards............	2	..	13	2	..	18	..	1	10	..	..	5	1	1	.	22	11	169	202	16.40
Never regular	1	..	17	1	2	3	..	1	1	..	..	..	..	..	..	9	12	55	76	6.17
																			1231	
Summary—																				
Regular from the first	21	19	147	8	12	87	1	4	26	2	1	8	2	..	..	209	194	1230	1633	74.97
Percentage	11.23	10.16	78.07	7.47	11.21	81.21	3.22	12.90	83.89	18.18	9.09	72.72	100.	..	..	12.79	11.88	75.31	..	
Regular afterwards............	4	6	26	6	2	23	..	3	11	..	1	7	1	1	..	53	57	238	348	15.97
Percentage	11.11	16.66	72.22	19.33	6.45	74.19	..	21.42	78.57	..	12.50	87.50	100.	100.	..	15.23	16.37	68.39	..	
Never regular	4	2	24	3	5	8	1	4	4	..	1	2	..	..	1	35	43	119	197	9.00
Percentage	13.33	6.66	80.00	18.75	31.25	50.00	11.11	44.44	44.44	..	33.33	66.66	..	..	100.	17.76	21.82	60.40	..	
Total as to condition...........	29	27	197	17	19	118	2	11	41	2	3	17	3	1	1	297	204	1587	2178	
Percentage	11.46	10.67	77.86	11.04	12.34	76.62	3.70	20.37	75.93	9.09	13.63	77.27	100.	100.	100.	13.63	13.49	74.87		
Totals for each menstrual year	253			154			54			22			3	1	1					

TABLE VIII.—*Regularity of Menstruation, and average age at Puberty.*

	REGULAR FROM THE FIRST.				REGULAR AFTERWARDS.				NEVER REGULAR.				TOTAL.			
	Unmarried.	Sterile.	Fruitful.	Total.	Unmarried.	Sterile.	Fruitful.	Total.	Unmarried.	Sterile.	Fruitful.	Total.	Unmarried.	Sterile.	Fruitful.	Summary.
Number with pain in the beginning . .	37	98	74	209	10	21	22	53	10	16	9	35	57	135	105	297
Average age at puberty	13.81	14.10	13.41	13.85	14.20	13.57	14.13	13.84	15.00	14.00	14.00	14.28	14.08	14.06	13.67	13.99
Number with pain during the flow . .	51	107	36	194	25	21	11	57	8	23	12	43	84	151	59	294
Average age at puberty	14.39	14.12	14.02	14.12	14.16	14.42	14.54	14.31	13.37	14.91	14.32	14.46	14.22	14.28	14.00	14.21
Number free from pain	152	235	843	1230	24	45	169	238	33	31	55	119	209	311	1067	1587
Average age at puberty	14.19	14.17	14.08	14.11	14.45	14.17	14.34	14.32	14.39	14.64	14.46	14.48	14.21	14.22	14.14	14.17
Total number . . .	240	440	953	1633	59	87	202	348	51	70	76	197	350	597	1231	2178
average ages .	14.17	14.14	13.92	14.08	14.28	14.09	14.32	14.25	14.35	14.58	14.38	14.44	14.22	14.18	14.09	14.14

longer, on an average, than in those cases in which pain occurred only at the beginning. The average on the total number was 14.14 years, and approached nearest to that found where the flow had been free from pain.

The average age for the fruitful women, who were regular from the first but with pain in the beginning of the flow, was found to be earlier than that of the sterile or unmarried, under either condition, that is, as to the existence or absence of pain. The reverse, however, is true in comparison with the sterile, where menstruation became regular afterwards, since in this condition puberty was delayed with the fruitful women. The number of those who were never regular is almost too small to furnish any definite data, yet the average age for the fruitful is earlier than for either the sterile or unmarried women. On the general average the age of puberty, under all conditions, as to pain, is also at the earliest date for those who were fruitful in after life.

Unfortunately, we have no data to show the average age at puberty of those who were healthy in after life. Until this is known, all comparison must be based on the different degrees of liability to disease, if the age at puberty has any relation to the subsequent state of health. We have already seen that the average age at puberty, as taken from the observations cited by Dr. Tilt, is 14.92 years. The results of my observations seem to show that women in this country develop at an earlier age than in England. But before we can arrive at any definite conclusion, the comparison must be made between those of corresponding stations in life. I assume, in the absence of any evidence to the contrary, that the observations in England were made upon the same class of women as are treated in the public institutions of this country. If so, any comparison would lead to error, since I am convinced that careful records would show that the average for the same class of patients in this country would approximate nearer to the English average than to the one I have given. If it be shown that the average age at puberty, for the better classes of England, is so much later than in this country, it would indicate that a larger proportion of our women are sterile; or, when fruitful, more liable to disease and early loss of youth.

The average duration of menstruation at puberty is shown by Table IX. to be, for all women, 4.82 days. For the class of cases fruitful in after life, the duration was 4.91 days, and of greater length than the general average found for either the unmarried or sterile. The

TABLE IX.—*Condition of Menstruation as to Pain, at the Beginning, during the Flow, or free from Pain.*

	Age of first menstruation	10.			11.			12.			13.			14.			15.		
	Condition of menstruation as to pain, etc.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.
Unmarried.	Number of, for each condition of flow	1	....	2	4	4	4	5	11	22	9	12	47	18	24	57	8	15	27
	Length of menstruation for each condition in days	7.00	....	6.00	6.75	5.50	5.75	5.00	4.91	4.27	4.66	5.66	4.47	4.58	4.91	4.51	4.37	5.00	4.74
	Average length of menstruation for each age	6.33			6.00			4.55			4.70			4.67			4.76		
Sterile.	Number of, for each condition of flow	1	....	4	5	3	8	10	16	34	36	37	67	42	36	66	19	24	55
	Length of menstruation for each condition in days	4.00	....	3.75	4.40	5.33	5.00	5.60	5.31	4.94	5.08	5.11	4.92	4.21	5.19	4.75	4.79	5.04	4.25
	Average length of menstruation for each age	3.80			4.87			5.15			5.01			4.70			4.55		
Fruitful.	Number of, for each condition of flow	1	..	7	5	4	33	16	4	137	22	15	159	28	16	259	16	12	150
	Length of menstruation for each condition in days	4.00	....	5.00	4.60	7.25	5.30	4.81	4.25	4.76	5.27	5.26	4.64	5.28	5.18	5.08	4.94	5.08	4.77
	Average length of menstruation for each age	4.67			5.40			4.75			4.76			5.10			4.80		
Summary.	Total for each condition of flow	3	....	13	14	11	45	31	31	193	67	64	273	88	76	382	43	51	232
	Length of menstruation on the total for each condition	5.00	....	4.76	5.14	6.09	5.28	5.09	5.03	4.74	5.08	5.25	4.68	4.69	5.10	4.93	4.76	5.01	4.64
	Average length of flow on the total for each age	4.81			5.38			4.82			4.83			4.92			4.72		

TABLE IX.—*Continued.*

	Age of first menstruation	16			17.			18.			19.			20.	21.	23.	Summary.			
	Condition of menstruation as to pain, etc.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	No pain.	No pain.	No pain.	Beginning.	During.	No pain.	Total.
Unmarrie	Number of, for each condition of flow....................	5	7	28	6	8	12	1	3	5	....	....	5	....	....	....	57	54	209	350
	Length of menstruation for each condition in days.....	5.00	5.00	3.78	5.50	4.62	4.08	2.00	3.33	5.80	....	....	3.80	....	....	....	4.98	4.98	4.43	
	Average length of menstruation for each age...........	4.15			4.58			4.55			3.80			....	....	....	4.65			
Sterile.	Number of, for each condition of flow....................	14	19	40	5	8	28	1	5	4	2	3	4	....	....	1	135	151	311	597
	Length of menstruation for each condition in days.....	4.28	5.05	4.05	4.06	3.87	4.60	6.00	3.40	7.00	3.00	4.33	5.25	....	....	1.00	4.62	5.00	4.63	
	Average length of menstruation for each age...........	4.35			4.61			5.10			4.44			....	....	1.00	4.74			
Fruitful.	Number of, for each condition of flow....................	10	1	116	6	3	72	....	3	27	....	....	8	2	1	....	104	58	971	1133
	Length of menstruation for each condition in days.....	4.20	6.00	4.96	4.50	6.66	5.00	....	3.33	4.52	....	....	5.50	3.00	4.00	....	4.96	5.08	4.88	
	Average length of menstruation for each age...........	4.91			5.02			4.40			5.50			3.00	4.00	....	4.91			
Summary.	Total for each condition of flow......................	29	27	184	17	19	112	2	11	36	2	3	17	2	1	1	296	293	1491	2080
	Length of menstruation on the total for each condition....	4.38	5.07	4.58	5.23	4.63	4.80	4.00	3.36	4.97	3.00	4.33	4.94	3.00	4.00	1.00	4.83	5.04	4.77	
	Average length of flow on the total for each age..........	4.61			4.83			4.57			4.68			3.00	4.00	1.00	4.82			

average for the sterile was 4.74 days, and for the unmarried the flow was of shorter duration than for any other class of women.

This table establishes one point beyond question, viz., that the local condition which gives rise to pain exercises a marked influence in increasing the menstrual flow beyond the general average as to duration, but not necessarily as to quantity.

In the absence of pain, menstruation, for all women, lasted for a shorter time than when pain was present. When the pain existed during the period, the flow was prolonged to a greater length than the average time found for those who only suffered pain at the beginning. The average length of the flow, with pain at the beginning, is very nearly the same for the unmarried and fruitful, but is less for the sterile. This circumstance would indicate that the sterile suffered less pain than either the fruitful or the unmarried, which is, apparently, in contradiction to the general law. But we must look to some other cause exerting an influence specially on the condition which, in after life, is to result in sterility. The general law is proved by the averages obtained for the unmarried, sterile, and fruitful, separately, and confirmed when taken on the total number collectively.

It will be noted, also, that the fruitful women who suffered pain during the flow menstruated for a longer period than either the unmarried or sterile, and, consequently, this class of cases must have suffered more from dysmenorrhœa. We must assume this result to be due to some accidental cause, for the number of cases is comparatively so small that the average would be easily affected by individual peculiarities.

We have shown that painful menstruation is abnormal, and it has been proven that pain lengthens the duration of the flow. Therefore, as the difference exists chiefly between the two classes, afterwards sterile and fruitful, it must be attributed to accident, since, if any condition exists at puberty which could determine the subsequent sterility, those afterwards fruitful would at puberty have approached, by comparison, nearer to a normal standard.

Table IX. also gives the average length of menstruation for each year and for each condition, as to pain, for the unmarried, sterile, and fruitful, as well as for the total number.

The only marked exceptions to the general laws, already stated, are to be found at either extreme, and where the numbers are small. The longest duration of the flow in the total number and for the fruitful is found to be for those who menstruated for the first time at eleven years, and for the sterile at twelve years of age.

It will be seen by Table X. that the flow lasted longer for the total number and for the sterile who menstruated for the first time below the age of fourteen, while for the fruitful, the reverse was found. The greatest difference between the two averages was found for the sterile. When menstruation was accompanied with pain, and puberty took place below the age of fourteen, the flow was longer under all conditions than when free from pain. The average on the total number is not only made out for those who were afterwards sterile or fruitful, but also includes those who remained unmarried.

TABLE X.—*Giving the Average Length of the Flow for those who Menstruated for the first time above or below the age of Fourteen.*

	Sterile.		Fruitful.		On the total number unmarried, sterile, and fruitful.	
	Above Fourteen.	Below Fourteen.	Above Fourteen.	Below Fourteen.	Above Fourteen.	Below Fourteen.
With pain at the beginning of the flow	4.68	5.09	4.62	5.00	4.83	5.12
With pain during the flow	4.71	5.17	4.57	5.43	4.79	5.27
Free from pain	4.35	4.91	4.83	4.76	4.67	4.68
Average length of menstruation on the total number	4.50	5.01	4.85	4.82	4.68	4.80

By the plan followed in Table XI. any change in the menstrual flow in after life can be seen from the average duration which existed at puberty.

The influence exerted by regularity and pain, in determining the length of the period, is also shown for the unmarried, sterile, and fruitful women separately, and there is a summary for the total number.

Two thousand and eighty women commenced their menstrual life with the flow averaging 4.82 days, and it is shown by this table that the average in after life, for the same females, was reduced to 4.66 days.

The duration of flow was shortened in after life for all the unmarried and sterile women, but for the former class the change was most marked. With the fruitful woman, however, the period became somewhat lengthened. The general law is noted as to the connection

TABLE XI.—*Length and Regularity of Menstruation.*

	REGULAR FROM THE FIRST.				REGULAR AFTERWARD.				NEVER REGULAR.				SUMMARY.			
	Unmarried.	Sterile.	Fruitful.	Total cases and average length of period.	Unmarried.	Sterile.	Fruitful.	Total cases and average length of period.	Unmarried.	Sterile.	Fruitful.	Total cases and average length of period.	Unmarried.	Sterile.	Fruitful.	Total cases and duration of period.
Number of cases with pain at the beginning of the flow	37	98	74	209	10	21	22	53	10	16	8	34	57	135	104	296
Average length of menstruation— At puberty	5.05	4.53	4.57	4.79	5.40	5.38	5.36	5.37	4.30	4.12	4.62	4.29	4.98	4.62	4.96	4.83
In after life	4.80	4.41	4.58	4.64	4.90	4.57	5.36	4.96	4.55	3.76	4.02	4.23	4.77	4.37	4.97	4.66
Number of cases with pain during the flow	51	107	36	194	25	21	11	57	8	23	11	42	84	151	58	293
Average length of menstruation— At puberty	5.09	5.16	5.28	5.17	5.08	4.66	6.27	5.15	4.00	4.52	4.18	4.33	4.98	5.00	5.08	5.04
In after life	4.96	4.95	5.20	5.00	5.00	4.33	6.50	5.01	3.50	4.77	3.27	4.12	4.83	4.84	5.05	4.87
Number of cases free from pain	152	235	756	1143	24	45	163	232	33	31	52	116	209	311	271	1491
Average length of menstruation— At puberty	4.43	4.64	4.92	4.80	4.33	4.68	4.78	4.72	4.51	4.51	4.55	4.53	4.43	4.63	4.88	4.77
In after life	4.69	4.64	4.96	4.85	4.42	4.53	4.81	4.72	4.06	4.78	4.58	4.49	4.56	4.64	4.91	4.81
Total number of cases under all conditions	240	440	866	1546	59	87	196	342	51	70	71	192	350	597	1133	2080
Average length of menstruation— At puberty	4.62	4.77	4.94	4.85	4.83	4.85	4.93	4.89	4.39	4.43	4.50	4.44	4.65	4.74	4.91	4.82
In after life	4.72	4.66	4.96	4.85	4.77	4.40	4.96	4.81	4.06	4.57	4.38	4.36	4.67	4.63	4.93	4.66

between the degree of pain and shortened duration of the menstrual flow, when the averages are taken on the total number for each condition. For all classes of women there was a slight increase in the length of flow when it became free from pain in after life. Where pain had existed, the change was greatest, as shown in the reduction of the length of flow for the sterile women, while the average remained but little changed for the fruitful with either condition, as to pain. The increased duration for those who had been free from pain was almost entirely confined to the unmarried.

On the total number who were regular from the first, no change took place in after life, the average duration of flow remaining the same as it was at puberty. But for all women who were regular yet suffered from pain, the time of flow was shortened. The only apparent exception to the general rule was with the fruitful women, who had pain in the beginning of the flow, and for this class there was practically no change. Where the flow had been free from pain, but regular from the beginning, the average for the unmarried and fruitful women was lengthened, while that for the sterile remained unchanged.

In all women who become regular after a certain time, the menstrual flow was shortened in after life. Under the same classification the period became lessened also with all women who suffered from pain. When free from pain the average duration was increased for the unmarried, and lessened for the sterile women, but on the total average it became shortened for both classes. The average for the fruitful women remained unchanged from puberty where pain had existed at the beginning of the flow, but under each other condition and on the total number it was also lessened in duration.

The average for the total number of women who were never regular shows that the period became, in the same manner, shortened during after life. On making a comparison between each class of women, it is found that the average was reduced for the unmarried and fruitful while the flow was lengthened for the sterile. For the total number of women who had suffered pain either at the beginning, or during the flow, or had been free from pain, and had never been regular, the flow become less. As was the case with those who had become regular afterwards, but suffered pain at the beginning of the period, the unmarried of this class, who were never regular, menstruated for a longer time in after life, while the average for the fruitful remained unchanged. Under the same conditions, the duration was shortened for the sterile women. With pain during the flow, the average was

TABLE XII.—*Condition of Menstruation at Puberty, with Changes in After Life in both Length and Quantity.*

NOTE.—Figures referring to duration or length of menstruation denote the time in days.		REMAINED UNCHANGED IN LENGTH						SUMMARY.			CHANGED IN LENGTH, IN AFTER LIFE,						SUMMARY.				SUMMARY FOR ALL CONDITIONS.			
		and quantity, being from the beginning,			but the quantity became afterwards either			Where menstruation in after life remained unchanged in length.			being increased, and the quantity either			being lessened, and the quantity either			Where menstruation in after life became changed both in length and quantity.							
		Normal.	Too free.	Scanty.	Increased.	Lessened.	Irregular.	Number of cases.	Average length of period.	Percentage for each condition.	Increased.	Lessened.	Irregular.	Lessened.	Increased.	Irregular.	Number of cases.	Average length of period at puberty.	Average length of period in after life.	Percentage for each condition.	Total number of cases.	Average length of the period at puberty.	Average length of the period in after life.	Percentage of the total number for all conditions.
Unmarried.	Normal	73	......	......	......	......	......	73	4.80	31.73	......	......	......	......	......	......	......	......	......	......	73	4.80	4.80	22.67
	Too free	......	23	......	......	......	......	23	6.52	10.00	......	......	......	......	......	......	......	......	......	......	23	6.52	6.51	7.14
	Scanty	......	......	31	......	......	......	31	2.83	13.47	......	......	......	......	......	......	......	......	......	......	31	2.83	2.83	9.62
	Increased	......	......	......	44	......	......	44	5.20	19.13	39	......	......	......	4	......	43	3.86	5.76	46.73	87	4.54	4.75	27.01
	Lessened	......	......	......	......	40	......	40	4.27	17.39	......	2	......	39	......	......	41	5.60	2.87	44.56	81	4.95	4.76	25.15
	Irregular	......	......	......	......	......	19	19	4.63	8.26	......	......	5	......	......	3	8	4.37	5.25	8.69	27	4.55	4.81	8.38
	Number	......	......	......	......	......	......	230	4.68	......	......	......	......	......	......	......	92	4.68	4.43	......	322	4.68	4.61	
	Percentage for each condition.	22.67	7.14	9.62	13.64	12.42	5.90	......	......	71.42	12.11	.62	1.55	12.11	1.24	.93	......	......	......	28.57				
Sterile.	Normal	121	......	......	......	......	......	121	4.68	31.78	......	......	......	......	......	......	......	......	......	......	121	4.08	4.68	21.45
	Too free	......	33	......	......	......	......	33	6.60	8.66	......	......	......	......	......	......	......	......	......	......	33	6.60	6.60	5.85
	Scanty	......	......	55	......	......	......	55	3.14	14.43	......	......	......	......	......	......	......	......	......	......	55	3.14	3.14	9.75
	Increased	......	......	......	71	......	......	71	5.23	18.63	64	......	......	......	3	......	67	4.26	6.94	36.61	138	4.76	6.06	24.46
	Lessened	......	......	......	......	78	......	78	4.39	20.47	......	5	......	93	......	......	98	5.72	3.03	53.55	176	5.13	3.63	31.20
	Irregular	......	......	......	......	......	23	23	4.00	6.03	......	......	12	......	......	6	18	4.02	4.72	9.83	41	4.02	4.31	7.26
	Number	......	......	......	......	......	......	381	4.63	......	......	......	......	......	......	......	183	5.02	4.62	......	564	4.76	4.63	
	Percentage for each condition,	21.45	5.85	9.75	12.58	14.	4.07	......	......	67.55	11.34	.88	2.12	16.18	.53	1.06	......	......	......	32.44				

Table XII.—(Continued.)

Fruitful.	Normal	185	......	......	......	......	......	185	4.66	25.06	......	......	......	......	......	......	......	......	......	......	185	4.66	4.66	16.75
	Too free	......	50	......	......	......	......	50	6.58	6.77	......	......	......	......	......	......	......	......	......	......	50	6.58	6.58	4.52
	Scanty	......	......	50	......	......	......	50	2.72	6.77	......	......	......	......	......	......	......	......	......	......	50	2.72	2.72	4.52
	Increased	......	......	......	265	......	......	265	5.43	35.90	170	......	......	......	10	......	160	4.15	5.00	40.18	445	4.93	5.27	40.30
	Lessened	......	......	......	......	113	......	113	4.56	15.31	......	15	......	133	......	......	148	5.82	3.43	40.43	261	5.27	3.92	23.64
	Irregular	......	......	......	......	......	75	75	4.66	10.16	......	......	25	......	......	13	38	5 07	5.65	10.38	113	4.60	5.00	10.23
	Number	......	......	......	......	......	......	738	4.93	......	......	......	......	......	......	......	366	4.92	4.43	......	1104	4.93	4.96	
	Percentage for each condition,	16.75	4.52	4.52	21.00	10.23	6.79	......	......	66.84	15.39	1 35	2.26	12.04	.90	1.17	......	......	......	33.15				
Summary.	Normal	379	......	......	......	......	......	379	4.69	28.10	......	......	......	......	......	......	......	......	......	......	379	4.69	4.69	19.04
	Too free	......	106	......	......	......	......	106	6.57	7.85	......	......	......	......	......	......	......	......	......	......	106	6.57	6.57	5.32
	Scanty	......	......	136	......	......	......	136	2.91	10.08	......	......	......	......	......	......	......	......	......	......	136	2.91	2.91	6.83
	Increased	......	......	......	380	......	......	380	5.38	28.16	273	......	......	......	17	......	290	4.13	5.56	45.25	670	4.81	5.02	33.66
	Lessened	......	......	......	......	231	......	231	4.45	17.12	......	22	......	265	......	......	287	5.75	3.21	44.77	518	5.17	3.77	26.03
	Irregular	......	......	......	......	......	117	117	4.52	8.74	......	......	42	......	......	22	64	4.70	5.35	9.98	161	4.59	4.81	9.04
	Number for each condition,	379	106	136	380	231	117	......	......	......	273	22	42	265	17	22								
	Percentages on the total number of cases,	19.04	5.32	6.83	19.09	11.60	5.87	......	......	67.28	13.71	1.10	2.11	13.31	.85	1.10	......	......	......	32.21				
	Total number of cases	......	......	......	......	......	......	1349	......	......	......	......	......	......	......	......	611	......	......	......	1990			
	Av. length of menstruation:																							
	at puberty	4.69	6.57	2.91	5.38	4.45	4 52	......	4.80	......	4.07	4 27	4.42	5.88	5.17	5.22	......	4.92	......	......	......	4.84		
	in after life	4.69	6.57	2.91	5.38	4.45	4.52	......	4.80	......	5.71	6.54	6.50	2.93	3.05	3.13	......	......	4.58	......	......	......	4.70	

reduced for the unmarried and fruitful women, but increased for the sterile. In this absence of pain, the unmarried menstruated afterwards for a much shorter time than at puberty, while the flow was increased greatly for the sterile and, to a less degree, for the fruitful women.

Menstrual Changes in Quantity and Duration.—We have shown in Table XII. various changes which took place after puberty in the menstrual flow of one thousand nine hundred and ninety women. By comparison with Table XI., it will be seen that a difference exists in the two tables between the averages given of the length of the menstrual flow at puberty and in after life. These are, however, so slight that the difference could easily have resulted from individual cases, and are really of little practical importance, since they bear about the same proportion to each other.

By reference to the lower division of Table XII. it will be seen that with 1349 women, or 67.28 per cent. of the whole number, the length of menstruation remained from puberty unchanged. But of these a certain proportion had the quantity altered. In the first section of those with whom the time remained the same, a certain proportion were normal, too free, or scanty in quantity from puberty, and their condition so remained. For the second section of the same division the quantity became increased, lessened, or irregular, but the length of flow continued also unchanged. The average duration of the menstrual flow is given for each condition as to quantity, and, in the next column, the percentage on the whole number of cases belonging to this class; while in the lower division of the table is shown the percentage of each on the total number of women. Thus, with 19.04 per cent. of all under observation, the menstrual flow remained normal as to time and quantity, while the number of the same class was 28.10 per cent. of those with whom the time remained unchanged from puberty. In this connection it will be noted that a larger proportion of the unmarried remained normal and unchanged as to time and quantity, while the smallest percentage was for the fruitful women.

Of the total number under observation, 641 women, or 32.21 per cent., suffered a change in both time and quantity. In the first section of this division the time became lengthened, with the quantity either increased, lessened, or irregular. In the second section the duration of the flow became shortened, with the quantity lessened, increased, or irregular. The average length of menstruation at puberty is given, and with it the duration in after life.

For the purpose of explaining the table, we will take, as an example, the class with whom the menstrual flow was increased. Thus with

380 women, or 19.09 per cent. of the total number under observation, the time remained the same from puberty, but the quantity increased, while the average duration of flow was 5.38 days; and this group was 28.16 per cent. of those with whom the time remained unchanged; 273 cases, or 13.71 per cent. of the whole number, had the time lengthened and quantity increased; and below, in the same column, is shown the increase from 4.07 to 5.71 days; 17 cases, .85 per cent. of the whole, had the time shortened from 5.17 to 3.05 days, but the quantity was increased—thus making a total of 290 with whom the time was either lengthened or shortened, but, with both classes, the quantity increased. The average duration of flow at puberty for these cases was 4.13, and was lengthened to 5.56 days. These 290 cases formed 45.25 per cent. of the number with whom the quantity was increased, while the time was either lengthened or shortened. For the total number, 670 cases, the average duration of the menstrual flow at puberty was lengthened from 4.84 to 5.02 days, and this class formed 33.66 per cent. of the total number of women under observation.

It will be seen that a smaller proportion of the fruitful women commenced their menstrual life with the flow too free, than either of the sterile or the unmarried. But the percentage of fruitful with whom the flow increased in after life, is nearly twice as great as the proportion for either the sterile or unmarried under the same circumstances. On the other hand, the proportion is greatest for the sterile, and least for the fruitful women, when the flow became reduced in quantity after puberty. More than twice as many sterile as fruitful women had scanty menstruation at puberty, and the same proportion is found to continue in after life.

We have already seen that of the women who were afterwards fruitful a smaller proportion at puberty were irregular as to time than either of the sterile or unmarried. But as regards irregularity in quantity, this table shows the proportion to be greater for the fruitful women, who were not only irregular in this respect at puberty, but continued so during after life, showing that while irregularity as to time is often associated with sterility, this condition as to quantity is not a bar to fruitfulness.

There are other points in detail which would be of interest to the student as part of the history of menstruation, but they are of too little practical importance to the general reader to engage our attention at greater length.

CHAPTER X.

ABNORMAL CHANGES IN THE MENSTRUAL FLOW.

Deviations from the normal standard—Amenorrhœa—Scanty menstruation—Menorrhagia—Membranous dysmenorrhœa—Vicarious memstruation—Hysteria.

These changes are to be regarded as symptoms only, having their origin often in opposite conditions, and requiring discrimination for their proper treatment. They are only grouped together for the consideration of common features, and that repetition may be avoided hereafter when treating of them separately.

Deviations from a normal standard may be classified under the following general heads:—

Changes
- *in time*, as to regularity and duration of flow.
- *in quantity*, from absence of menstruation to uterine hemorrhage.

These changes are frequently accompanied by certain

Nervous manifestations,
- *Painful menstruation*,
- *Hysteria*,
- *Functional reflex disturbances.*

All changes in time and quantity are so closely allied that the general consideration of one class must include the other.

We have fully considered elsewhere the absence of menstruation, due to retention, but in the condition now to be treated of, and termed amenorrhœa, there exists no obstruction to the escape of the menstrual flow. Amenorrhœa, a condition of the non-pregnant state, may be defined as a temporary suspension of the menstrual discharge after the organs of generation have reached a somewhat mature stage of development.

The opposite condition, *i. e.*, an excess as to quantity and duration, without reference to regularity, may be termed menorrhagia, to designate excessive menstruation, or, as a general term, metrorrhagia, or uterine hemorrhage. In practice every gradation in quantity will be found—from absence of, to excessive flow.

In the condition where amenorrhœa exists, the organs of generation are generally found sufficiently developed, and frequently no disease can be detected to explain the suspension of function. The cause exists in some defect in the ovary, but indirectly it is to be traced to some disturbance of the nervous system by which the nutrition of the whole body has become impaired. This is the rule, but apparent exceptions are met with where, with excess of general nutrition, menstruation ceases or becomes scanty, and is attended with atrophy of the ovaries and uterus early in life; yet, after all, when these organs do undergo fatty degeneration, the change is but one of faulty nutrition.

Amenorrhœa does not always accompany an anæmic condition, since profuse menstruation often occurs in the early stages of phthisis and other diseases, where, however, the rule is for nature to suspend the flow, as if to husband the strength by putting a stop to all extra waste.

Atrophy of the uterus is often found in connection with amenorrhœa, not as the cause, but as an effect of a common cause, since I have frequently observed atrophy taking place after the amenorrhœa had existed for some time.

It may be questioned if amenorrhœa can take place in health. When a sudden suppression of the menstrual flow occurs from emotional causes, or from exposure, the result should be accepted as evidence of some previous defect in the nervous system, although the female may have been at the time apparently in good health.

I have known an instance in which menstruation was suddenly arrested at the age of thirty by the announcement of the death of the husband, although the wife had been apparently in good health; but her nervous system had been over-taxed by anxiety for her husband's condition, and the result was that she never menstruated again, and atrophy of the uterus took place soon after.

I have met with a similar effect, and equally early in life, caused by a favorable verdict in a suit which had been the source of much anxiety, and upon the result of which depended a condition of affluence or poverty.

Another instance I have known in which a young woman who had been previously in perfect health, over-taxed her nervous system and nutrition to gain the highest honors at one of the female colleges. During the time of her course she had menstruated regularly, although often too freely, yet, from the time she gained the prize she ceased to menstruate, although several years had elapsed, and atrophy had taken place when I first saw her.

The young woman who, on getting her feet wet, has the menstrual flow arrested, with atrophy of the uterus sometimes following, suffers in the same way, although there may seem to be but little, if any, similarity in causation—exposure in the one case, and emotional influence in the other. Every girl who gets her feet wet during the menstrual period does not necessarily suffer ill consequences, nor does every woman have suppression who has been exposed to a sudden nervous impression. There must have been a previous depression of innervation, leaving a local condition too feeble to react from such a shock, which, like the thunderbolt, has its whole force expended on some ganglion or nerve centre, the effect of which would be a paralysis or suspension of the needed impulse from the nerve centre to the organ under its special influence. Each ganglion, it is thought, has the power of generating within itself a certain amount of nerve force, which it holds in reserve to resist any sudden shock. This vital force is life, and while a portion is concentrated in the nerve centres, the rest is sent out to the organ or organs within its jurisdiction, as it were, and this stimulus is health. When this influence fails to reach an organ, nutrition at once suffers, and atrophy naturally follows. We have already noted the relation between the sympathetic system and nutrition, and their connection with the circulation. If we accept these views there can be no other explanation than that the failure begins at some nerve centre, by which its influence is lost, so that functional disturbance is the consequence. When this nervous stimulus has been suspended sufficiently long to bring about atrophy of the uterus, we may naturally infer that the ovaries had previously suffered.

If this be the correct relation, it must necessarily narrow our field of treatment to improving, as far as possible, the general condition, and but little, if any, favorable results can be expected from local means. I have seen a temporary increase in the size of the uterus in consequence of the congestion attending the use of sponge tents or from electricity locally applied. But there can be no restoration of function, unless the general defect can be remedied. To accomplish this, we must resort, if possible, to the means enumerated in the chapter under the head of general treatment, making such changes or additions as the peculiarities of each case may suggest.

Scanty menstruation may be regarded as but a difference in degree from amenorrhœa. As a rule, the same general causes, as regards [illegible] nutrition, will lessen the amount of flow. There are exceptions, however, and yet, not strictly so, since a local congestion, or a condition by which the circulation is obstructed, will produce the same result. We have seen such a degree of obstruction to the circulation in the uterus, from congestion, that the menstruation became scanty or absent. This result is common also in cases of inflammation of the mucous membrane in any other portion of the body, the congestion being so great as to be, as it were, above the secreting point.

The condition of amenorrhœa, as well as that of a scanty flow, is often preceded for a period by profuse and irregular menstruation. The menstrual flow will frequently be very free after the recent occurrence of a backward version, but as the congestion increases, and a permanent retroflexion results, it will become both scanty and irregular. The same result is the rule with a flexure of the body above the vaginal junction. With cellulitis, the menstrual flow is almost always very free at first, but it becomes scanty afterwards, from obstruction to the circulation, as the parts which have been inflamed begin to contract. The growth of a fibroid may act mechanically, so as to almost cut off the supply of blood, particularly if the woman has previously suffered from hemorrhage. Other examples might be cited, but without advantage, since the modes of treatment would have nothing in common, and must necessarily be considered hereafter in their proper connections.

The unmarried woman between puberty and thirty-five years of age is sometimes liable to irregularity and a diminution in quantity of the flow, from the fact that she has not become a mother. But before she reaches the time for a change of life, the average length of the menstrual flow will be about the same as it was in the beginning, provided she has escaped the development of a fibrous growth in the uterus. The sterile woman will have the average lessened in after life, if she does not suffer from a fibrous tumor.

The woman who has borne children is liable to irregularity, and an increase in both the quantity and duration of the menstrual flow, with all her symptoms exaggerated, as she approaches the time for a change of life. The woman who has miscarried is more likely to become irregular and profuse with the period than if she had carried a child to full term. After a criminal abortion, as a consequence of the cellulitis which occurs in every case almost without exception, the flow is usually scanty and irregular, although at first it may have been very profuse.

Menorrhagia.—The condition of amenorrhœa is considered, as a rule, to be associated with an enfeebled or scanty circulation; menorrhagia, on the contrary, is always dependent on a local congestion, or on an obstruction to the circulation elsewhere.

The causes of menorrhagia may be generally classified as follows:—

Constitutional defects associated with anæmia.
Obstruction to the circulation, in consequence of disease elsewhere.
Local causes, confined to the uterus.

The constitutional condition rendering the woman liable to uterine hemorrhage is such as attends prolonged lactation, malaria, or any other disease by which the blood is impoverished. Disease of the heart, liver, or kidneys will, by obstructing the circulation in these organs, cause uterine hemorrhage. Chronic constipation will act mechanically by obstructing the return flow of venous blood from the pelvis into the portal system. Displacements, cellulitis, and growths in the pelvis, having no direct connection with the uterus, will also act mechanically by obstructing the circulation, so as to produce uterine hemorrhage. New growths, as a local cause, and connected directly with the uterus, we will find, however, to be the most frequent cause of menorrhagia.

As a rule, menorrhagia from constitutional causes is most commonly found in young women, while those who have borne children, and all who approach middle life, suffer generally from a local cause.

The development of fibrous growths in connection with the uterus is, as stated before, the most common cause of irregularity and increase of the menstrual flow, for all classes of women. But women who have borne children suffer from the effects of various local injuries, which afterwards play a most important part in disturbing menstruation and causing hemorrhage. Laceration of the cervix will be found to be the most frequent injury, as well as the most common cause of irregularity, both as to time and quantity. Displacements of the organ, growths within the uterine canal, as fibrous polypi, growths from the mucous membrane, as granulations, mucous polypi, and malignant disease—all cause uterine hemorrhage. When a loss of blood continues after a miscarriage or childbirth, and the uterus has become sufficiently contracted to prevent post-partum hemorrhage proper, the flow may be considered as due to a portion of the placenta being retained, or to a lacerated cervix. With the first condition, the external hemorrhage is not continuous, but becomes more marked when the uterus expels the clot. It is not within my purview to enter at any greater length into a consideration of hemorrhage from this cause. Should the bleeding from the vagina be continuous, and if there has been any laceration externally, the probabilities are greater that the cervix has been deeply lacerated so as to involve the circular artery. I am not aware that any case has been placed on record where death has resulted directly from this injury, but it has entailed years of suffering which, I am satisfied, in many instances, might have been prevented. When this hemorrhage occurs, it will add but little to the danger of the patient to have her well wrapped up and lifted upon a proper table for examination immediately. If, on introducing the speculum, the bleeding is found to come from the bottom of a laceration in the cervix, I believe that it would be good practice to close it. This can be done by the introduction of several interrupted silver sutures, and the parts may be brought together in less than ten minutes, if the operator has the slightest dexterity, for the surfaces are then soft, and already lie in contact. We will thus save the patient's strength, by arresting an oozing which may go on for days, and we will lessen the risk of blood-poisoning to which she will be exposed as long as these raw surfaces are bathed in the uterine discharges. We will certainly remove a source of irritation, for if the laceration be left uncared for, involution will be at once arrested, and if the uterus be allowed to remain too large the woman must necessarily suffer from a displacement or sagging of the organ. As a consequence of this injury, menstruation will suffer much derangement, and the patient must eventually submit to an operation far more serious in character than it would have been at first.

There are certain rules which are applicable to the treatment of all forms of hemorrhage from the female organs of generation not dependent on the puerperal state. Rest in the horizontal position, a quiet mind, a hard bed, and a cool atmosphere are essential for arresting hemorrhage, without reference to its cause or the necessary local treatment.

Internal remedies can be but little relied upon to control hemorrhage without the aid of local means. Opium, however, in some form, and by enemata or rectal suppositories, should always be employed when necessary to quiet the circulation, or to allay pain. The combination of a small quantity of ipecac with opium, as in Dover's powder, may take the place of the opium by the bowel when the skin is found dry and inactive. In the absence of pain or nervousness aconite may be used with stimulants to quiet the heart's action when the patient has suffered from loss of blood; but nutritious agents, as beef-tea, must be freely employed at the same time. The acetate of lead and opium, alum, ergot, and other remedies, have also been used internally. The opium is as efficacious without the lead; from alum I have never seen any effect when taken internally, except nausea; while ergot can have little effect on the bloodvessels by exciting the uterus to contraction, unless the organ be enlarged. From five to ten grains of gallic acid dissolved in equal parts of pure water and cinnamon water, with a little syrup, may be given every two or three hours, according to circumstances. Cinnamon frequently seems to exert a marked influence on the circulation of the uterus, and makes a good combination with the gallic acid. Only from this preparation and from opium have I seen any certainty of action, and even these are of but little value, except to control passive hemorrhage when accompanied by an anæmic condition.

As soon as there exists an indication of excessive flow an examination must be made with the view of ascertaining the cause, and of arresting it as soon as possible, that the strength of the patient may not be dissipated. When the hemorrhage is found to come from the uterine canal, it is best to resort to a tampon at once, to be introduced in the manner already described in a previous chapter. After the bleeding has once been checked, a diagnosis can be formed, by dilating the canal if necessary, and the mode of treatment hereafter to be described under the head of the special disease can be instituted. Should the loss of blood be due to the presence of some malignant disease on the cervix or in the vagina, a tampon would be of little service, and might produce much irritation. In such cases I employ large injections of water as hot as can be borne, and I find that this will generally arrest the bleeding. Afterwards, a pledget of cotton soaked in a saturated solution of alum may be carefully spread over the surface, to be removed within twelve hours, by means of a string which is left attached to it. I no longer employ the persulphate of iron as a local agent; under these circumstances, if the iron is used, the vagina becomes so dry and irritated, that the tampon cannot be again properly replaced. When a tampon is required, it is best to place first a portion of cotton saturated with alum over the cervix, and then to fill the vagina with oakum.

When, from excessive sexual intercourse, from taking cold after over-exertion, or from want of strength, a passive flow occurs, and out of time, or when menstruation becomes prolonged beyond its usual length, an injection of hot water, in connection with the use of gallic acid, will generally arrest the flow. When this treatment is adopted to check the flow, it is not attended with the slightest danger to the patient, since no shock is communicated by it to the nerve centres. The loss of blood is arrested by a natural process, since the stimulus of the hot water causes the vessels to lessen their calibre by contraction, and consequently all tendency to congestion will be thwarted. Should the flow result from some obstruction in the pelvis external to the uterus, as after an attack of cellulitis, a tampon cannot be employed. The chief treatment in this case will consist in the use of hot water injections, opium, and rest in the horizontal position, with the hips elevated. Sometimes a show will depend upon a fecal accumulation in the colon, and will continue from day to day in a quantity just sufficient to be an annoyance. Inspissated ox-gall, dissolved in warm water, for a large injection, to be given while the patient is on the knees and chest, will thoroughly remove the obstruction. We occasionally see in practice young girls who menstruate very profusely, and no cause can be detected beyond a condition of general plethora. The treatment between the menstrual periods must consist in regulating the diet, directing more exercise, the Turkish bath, and the free use of saline purgatives. Very much the same mode of treatment is useful for women going through a change of life who are over-plethoric, and when the hemorrhagic tendency is not due to any recognized local condition. Three cases are also benefited by a brisk mercurial purgative, taken a few days before each period, but long enough beforehand that its action may not have the effect of suppressing the flow.

It is of great importance that a woman should keep quiet at each menstrual period, long after the supposed cause of hemorrhage may have been removed, that the hemorrhagic habit may thus be overcome.

Dysmenorrhœa.—Every woman even in health will experience at least some degree of discomfort at the menstrual period. That she should be absolutely free from pain and suffer no inconvenience at this time is an abnormal condition. The degree of pain, however, varies by comparison, not only between individuals, but with the same person; thus great deviations from their usual habit will appear without being necessarily due to local disease.

The pain of menstruation bears, as a rule, some relation to the amount of flow, being great in proportion to the diminution in quantity, or to the degree of obstruction. This is the rule, but menstruation frequently becomes painful when the flow may have been already increased beyond the natural habit, and where no obstruction exists to its free escape.

Pain is frequently caused simply from the increased flow of blood to the parts, as the current comes to be turned in that direction in consequence of the hemorrhage.

But painful menstruation, as a rule, may be considered due to constitutional causes, although sometimes only indirectly. When a woman is anæmic, her condition is favorable to neuralgia, which, instead of locating elsewhere, expresses itself in painful menstruation, when the organs of generation happen to be wanting in tone. Were it possible to subject a woman in perfect health, and another while anæmic, to exactly the same circumstances provocative of pain, it would be found that the latter, with her nervous system deranged, would suffer far more than the former.

The most common cause of painful menstruation has been thought to be the existence of some mechanical obstruction to the free escape of blood from the uterine canal. Flexures of the uterus, where the organ has become bent on itself so as to obstruct the canal, and growths within the uterine tissue, which would act mechanically in the same manner, may be cited as examples. This view might be accepted without question, were it not that every observer has noticed instances where painful menstruation was not always an attendant on all forms of flexure or apparent obstruction to the canal. When a flexure is formed above the vaginal junction, the condition is one always attended with pain during the flow, and a state of obstruction does exist beyond question. But with a flexure at the vaginal junction, caused by the neck being too long and thin to remain straight in the vagina, the angle at which it is bent is always more acute than it is with a flexure in the uterine body. Notwithstanding this fact, and although the woman will probably be sterile, she does not necessarily suffer from painful menstruation. It should, therefore, be noted that flexure of the uterine body is a condition almost invariably accompanied by an impoverished state of the general health. But with flexure of the cervix at or below the vaginal junction, the general condition is rarely affected; and if so, it is not at all in consequence of an obstruction to the menstrual flow, but is due wholly to the effect of the sterility on the nervous system. It is by no means an uncommon consequence of the use of the nitrate of silver to find the womb nearly closed, and yet the condition seldom causes painful menstruation, but always sterility. I have observed several instances where the mucous membrane had become so contracted over the mouth of the canal, from the use of lunar caustic, that the orifice was too small to admit the finest probe. In these cases, I have seen the menstrual blood escape drop by drop from the small opening. No pain was suffered except where the flow was sufficiently abundant to fill the canal before it could be emptied. In that case, pain was caused by uterine contraction, the organ attempting to drive out a clot which had formed in consequence of the delay in the escape of the blood.

I feel satisfied from observation that, unless the flow is scanty, painful menstruation is accompanied by clots, and that their formation does not depend essentially on an obstruction. I hold this view from the fact that in several instances I have seen, by the aid of the speculum, one clot after another expelled from the uterus with pain, where the canal was not only straight, but also unusually large. Whatever the cause may be for painful menstruation, with flexure of the uterine body, it almost always exists in an aggravated form, and is never relieved by a surgical procedure alone. Occasionally, we do succeed, after an operation, in opening up the canal, where the flexure has been in the uterine body, so that an obstruction no longer exists, and yet, as has been said, the dysmenorrhœa is never relieved by the operation alone. I can offer no explanation for this form of painful menstruation, except one based upon theoretical views; yet, the circumstantial evidence is so conclusive that I believe further observation will show that my deductions have been correctly drawn.

With our present knowledge the weight of evidence is in support of the view already given, that the whole lining membrane above the internal os is removed at each menstrual period. In a state of health this process of disintegration, we may assume, takes place with but little disturbance. But, on the other hand, if, from some abnormal condition, this process be retarded, nuclei may be furnished for the formation of clots, which increase in size until the uterus becomes excited to contraction that they may be expelled. The pain thus caused is always intermittent, a character which goes to support the explanation just given. We thus have every degree of suffering, from a few pains at the beginning of the flow, before relief is obtained, to the form known as membranous dysmenorrhœa. In the entire condition the suffering is persistent until, by frequent contractions of the organ, the whole lining membrane of the canal, above the internal os, is thrown off in one mass. No obstruction exists in these cases to the free escape of blood; at least, in every instance which has passed under my observation, the uterine canal has been straight and the os sufficiently open.

It has been supposed that the formation of this false membrane, as it has been termed, is due to ovarian influènce; but of this we have no proof beyond the frequent coincidence of pain over the region of one or both of these bodies. The throwing off of this coat from the uterine canal is a frequent accompaniment of an enlarged and prolapsed ovary, but it does not always exist with this condition, and sometimes we are unable to detect the slightest disease in the ovaries.

It has also been supposed that this membrane was a product of inflammation, but of this we have no proof, while the weight of evidence rather points to the contrary.

Mr. Whitehead[1] has pointed out that the acid reaction of the vaginal secretions on the fibrin, prevents the menstrual blood from coagulating in the vagina, and it undoubtedly has this property. The opinion of this writer, and of others quoted by him, is to the effect that healthy menstrual blood is deficient in fibrin. This view was held by Dr. Carpenter, who, in his Physiology, states "when clots are found in it, therefore, a morbid condition of the secreting surface must be inferred." Mr. Whitehead found the menstrual blood deficient in fibrin after it had been exposed to the vaginal secretions, but, when the blood was collected on its escape from the uterine canal, there was but little difference detected between it and blood obtained elsewhere. The question may be mooted as to cause and effect, but the fact will be recognized that, with all these menstrual disorders, the general health is impaired and the blood is necessarily deficient in properties which would render it less likely to clot.

We must then accept the supposition, until proved to be erroneous by further observation, that a poor condition of the general health retards the disintegration of the uterine lining membrane.

When the menstrual flow comes on at its regular time, but before this membrane is in a condition to be readily washed away as débris, a nucleus will be furnished by it to retain the blood. The blood will be thus delayed in its escape from the canal long enough to form clot after clot, which will excite uterine contraction with pain, until all have been expelled.

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[1] On the Causes and Treatment of Abortion and Sterility, by James Whithead, F.R.C.S.

An undue amount of pelvic congestion during the menstrual period, either from an increased fluxion to the parts, or from obstruction in the venous circulation, may produce pain, at the same time, in the uterus and ovaries, without there being any other direct connection. This is a natural effect, since the circulation in both is so intimately connected; therefore, should local disease exist in either ovary, the pain will be well marked in that neighborhood, but merely as an effect of the general pelvic disturbance. When the ovarian function is defective from some general cause, and the ovaries are no longer able to generate the ovarian influence, the uterus must necessarily soon suffer. But we have no positive evidence that a diseased condition of one ovary alone will necessarily influence the uterine condition, while disease of the uterus certainly does not produce ovarian disturbance.

To recapitulate:—Whenever pain is expressed in the uterus and ovaries at the same time, we may, as a rule, conclude that both are suffering from some common disturbance, and this is generally to be traced to an obstructed circulation. As this obstruction is increased by the additional flow of blood attending menstruation, a coincident pain may be produced in the ovary, due to the aggravation of some local disease. From the marked character of the ovarian pain, it is often assumed that any uterine disease, which may happen to exist at the time, is a consequence of the ovarian condition, while the fact is, that both are but suffering from the effect of a common cause. A woman may suffer pain in the ovary at the menstrual period without there existing the slightest uterine disease which can be detected. The natural additional flow to the pelvis attending the period will cause suffering when inflammation of the ovarian tissue has previously occurred, or from adhesions binding the ovary down so as to obstruct its circulation. The pain at this time is also often great, in consequence of the presence of cicatricial or dense tissue within its own structure.

We have no means of recognizing ovarian diseases, unless the ovary becomes enlarged, which is comparatively rare, and on post-mortem examination the evidences of disease are very rare in comparison with the pathological changes found in the uterus itself.

Therefore, my convictions are, that ovarian disease has but little share, as compared with the uterus, in the pain of menstruation.

In the absence of any proof as to the connection between disease of the ovary and membranous dysmenorrhœa, I am disposed to attribute the discharge of the membrane en masse to a want of general tone. If we can accept the supposition that painful menstruation is ever due to a delay in the breaking down of the lining membrane of the uterus, it would be but another step in the same direction to attribute this "false membrane" to the same cause. Healthy changes in tissue do not take place rapidly where the general condition is as much reduced as it uniformly is in all cases which suffer from this form of painful menstruation. Therefore, it is not improbable that the want of general tone may be the cause of delay in this lining membrane undergoing the necessary fatty degeneration before disintegrating. The increased thickening of the membrane may be even due to perverted nutrition, as unhealthy granulations of increased size may spring from a surface in cases where the subject suffers from this same general condition. As the menstrual flow must come from the vessels below this thickened lining membrane, it would necessarily become detached in one piece, and could only be expelled from the cavity by uterine contraction, which would be accompanied by severe expulsive pains.

When the uterus or ovaries become heavy from undue congestion, or suffer from any other source of irritation, the impression then made on the extremities of the spinal nerves is at once transmitted to their seat of origin along the posterior portion of the spinal cord. Over the spine will be experienced a reflexion of the pelvic irritation. This will vary in degree, from the back-breaking pain which accompanies scanty menstruation, to the marked sensitiveness on pressure at some special point, which, in connection with some uterine or ovarian disease, is always more marked when the general condition is one of anæmia. Through the aid then of the sympathetic, as has already been described, the mode by which the disorders of menstruation may cause disturbance elsewhere, can easily be understood. These manifestations are recognized by various forms of backache, headache, irregular action of the heart, nausea, diarrhœa, increased action of the kidneys, cold feet, chilly sensations in varions parts of the body, and by different forms of hysteria. It would be of little practical value to consider the subject of reflex irritation at great length, and to do justice to the subject would occupy more space than its relative importance warrants. In a general manner, however, the subject will again be referred to under the head of treatment for hysteria.

Treatment of Dysmenorrhœa.—The first necessary step will be to determine the cause of painful menstruation, since the proper course of treatment must be directed by this knowledge. As different conditions will produce the same symptoms, as regards pain, a physical examination is often absolutely necessary. A conscientious man will seek to spare the feelings of a young girl from going through such an ordeal, but it often becomes a difficult matter, in discharging one's duty, to decide when it can be avoided. Where the flow is scanty, painful, and probably irregular, the examination may be delayed, provided the difficulty occurs in early menstrual life, and the cause may be reasonably attributed to over-taxing the nervous system by study. We may then watch the effect of an entire suspension of brain-work, and carefully look to improving the general condition.

I was latterly consulted by a lady of this city in regard to her daughter's condition; she had been menstruating regularly for two years. For six months after the first menstruation she had experienced little pain or inconvenience, but gradually the menstrual flow had become more painful, and at the last period she had suffered so much that it had been accompanied by hysterical convulsions. I learned that she had been growing so rapidly that it was difficult to keep her skirts to the proper length. She was tall for her age, but at first glance seemed to have been well nourished, and had a bright color. On examining, however, the condition of her heart I detected a well-marked anæmic murmur. She had been studying very hard at home for a year with private masters. I gained the key to the situation when I learned, that among her other studies, she had been in the habit of devoting five hours daily to her Latin. I felt that there was no necessity of seeking for a local cause under the circumstances. I insisted that all her studies should be discontinued; her general condition was looked after, and, as the weather was mild, she was directed to spend the greater part of each day at the Central Park, in the open air. There was a great improvement at the next period, and by the end of four months she reported herself perfectly well, as the last period had been passed without the slightest discomfort.

But, whenever the pain lasts throughout the flow, or comes on after it has ceased, with either an increase or diminution in quantity, and if there is any pain or fatigue from standing or walking, the examination must be made. Under these circumstances, the physician will not discharge his duty if he neglects doing so, or does not have it made by some one else if he has not himself had the necessary experience. The investigation is particularly called for when the occurrence or cause of pain can be traced to a fall or injury, or to a checking of the menstrual flow. If neglected, a condition, as the result of a displacement, or of disturbance in the circulation, will become established as a habit, which may only terminate with the life of the invalid. There exists sometimes a form of retroversion, having its beginning at puberty, and to be referred to hereafter, which must be corrected at an early age, or a retroflexion in after life will be the consequence. By the passage of the index finger into the rectum of a young girl, a vaginal examination may sometimes be avoided. By this mode, we can judge of a displacement, the occurrence of a present or previous cellulitis, and of the condition of the ovaries, should they be enlarged. It is of the utmost importance to determine if either of these conditions exists, in connection with painful menstruation in a young girl, and we should, therefore, at least make the rectal examination. If, from this exploration, it should be deemed necessary to make an examination by the vagina, it is better to give ether. We will thus spare much pain, both mental and physical, while from the relaxing effect of the ether the opportunity will be afforded for a thorough investigation, and also to dilate the parts sufficiently for applying the subsequent treatment if any be necessary.

This subject might have been treated of under the head of a "mode of examination." But, as I wished to avoid repetition, and to impress the importance of gaining an accurate knowledge of the condition of disease in young girls, I have, as a digression, considered the matter in connection with painful menstruation. Dysmenorrhœa, to any marked degree, almost always implies some important complication which should not be disregarded at any period of life, but especially is it paramount that we should fully appreciate the exact condition causing it in early life. Let us bear in mind the important fact already pointed out, that of all married women who had suffered pain during the menstrual flow in early life, 71.90 per cent. were sterile afterwards. I can scarcely turn over a dozen pages of one of my case books without recognizing, by the history of some case, that the woman was indebted for her condition of sterility or bad health to the prudish incapacity of her medical attendant in early life. Nature will accomplish marvellous results sometimes in restoration, but let the physician, as a matter of conscience, be first satisfied as to how far he may be justified in trusting to nature, and not remain in absolute ignorance of her capacity to perform the task.

When a young woman suffers from any local disease, it is rational to suppose that she should receive the proper treatment for her restoration to health as she would if she were older. A certain amount of physical pain may be unavoidable without ether, but if a young girl suffers the slightest injury to her modesty or moral condition by an examination, or the necessary treatment afterwards, the detriment will come from the method and not the occasion.

Dysmenorrhœa is rarely a consequence of any condition which can be corrected without subjecting the patient to a systematic course of treatment, so that certain palliative means will have to be resorted to, from time to time, until the cause has been removed. For the local treatment of dysmenorrhœa, as a symptom only, the reader must refer to the different conditions causing it. These are to be found under the head of flexures, uterine growths, lacerations of the cervix, inflammation of the pelvic tissues, and its consequences, displacements of the uterus, and the various conditions of the nervous system closely connected with faulty nutrition.

We have stated the rule that suppressed or a scanty menstrual flow is a condition generally accompanied by pain. When we are called upon to relieve a woman suffering with this condition of the flow, it is all-important that we should have a knowledge as to the cause. We will exclude those acting mechanically, as they are to be treated of hereafter, a faulty condition of the circulation, for example, being one of them.

From venous fullness, the pelvic organs may be so charged with blood as to suspend the flow, or cause it to be scanty and painful. From arterial fullness, the pelvic organs may be congested to the verge of inflammation, and the uterus be above the secreting point, or furnishing painful and scanty menstruation. From deficient ovarian action amenorrhœa or a scanty and painful flow may be found, with or without pelvic congestion.

We will be consulted, at the time of menstruation, only for the relief of one of these three conditions. Then the question will arise as to the proper mode of increasing the flow in quantity, that it may escape faster from the canal without forming a clot to excite the organ to painful contraction for its expulsion.

The first condition cited, that of venous congestion, is but an increase in degree of the state described as accompanying all uterine diseases of long standing. It is one where the vessels, having already lost their tone from impaired nutrition, become distended, almost to a state of stagnation, in consequence of the increased flow of blood to the pelvis at the time of the menstrual period.

The first effort must be directed to lessening the amount of blood in the pelvis, and to distributing it to the skin and extremities. When the suffering is very great, with a scanty flow, I often administer an emetic of ipecac., and cover the woman up warm in bed. As soon as the stomach becomes settled, the feet are to be put into a deep foot-bath of hot water and mustard. The bath should be administered as the patient lies in bed, and with as little exposure as possible. This can be done by placing something under the tub so as to elevate its edge nearly to the same level with the bed. Care must be taken to arrange the bedclothes so that they cannot become wet, and, to protect the patient's limbs, an extra blanket should be spread over them and the tub. An additional quantity of hot water should be added from time to time, so as to keep the temperature elevated to as high a point as can be borne. It is better that the feet should be retained in the bath until the skin has begun to act, when it is probable the first relief will be experienced by the patient. That the action may not be checked, the patient should lift her feet from the water as the tub is withdrawn from under the blanket, without exposure. Then the limbs must be quickly wrapped in the blanket which has covered them, and without drying the feet. To increase the action of the skin, some hot drink should be administered. Nothing is better than a cup of tea made by pouring hot water on a little essence of Jamaica ginger, to which may be added milk and sugar to make it more palatable. The main object, however, is the hot drink, and any thing else in the form of a tea will answer. I employ the ginger on account of its being a mild stimulant, and because it answers well to settle the stomach after the emetic. A stimulant is often serviceable, and this is quite sufficient for the purpose, even if an emetic has not been employed; and it is preferable to the gin and water which is generally used as a household remedy under the same circumstances. To keep up the action of the skin I usually administer, before the effect of the tea has passed away, half an ounce of the liquor ammoniæ acetatis and a third of a grain of ipecac. every two or three hours. As soon as the flow becomes well established, this remedy can be suspended, but the patient should remain in bed well covered up, with a receptacle for hot water at her feet.

When the pain is not severe the emetic may be dispensed with, and the hot foot-bath will be sufficient if the action of the skin is kept up afterwards. Great relief will be given sometimes to the backache by lifting up the uterus on the index finger for a short distance in the pelvis, and holding it in this position for a while. As has been previously shown, this manœuvre allows the uterus to relieve itself of the congestion produced by the prolapse, and by the traction on the vessels in the connective tissue of the pelvis. If, at length, sufficient relief has not been obtained, an anodyne must be administered, and it will be more efficacious by the rectum. I generally use a suppository of morphine and belladonna, but we should avoid anodynes if possible, since after their use the flow is not likely to be as free, and the action of the skin will be lessened. When opium in any form has been used, it is best to establish a revulsive effect along the spine, since, as I have often observed, the kidneys are then more likely to increase their action, and there will be less suffering from the after effects of the remedy. This can be done by placing a mustard plaster, about three inches in width, from the cervical region to the sacrum. A rapid action is needed, and to produce this, the unadulterated mustard flour must be rubbed up into a thick paste with warm water, and then reduced to a proper consistency by adding an ounce or two of syrup or molasses, which will at once develop the volatile oil. A piece of unstarched muslin of the proper length, and of some nine inches in width, is used. The cloth is to be laid out at full length, and the mustard spread down the centre for one-third of the width, so that when it is folded over, the mustard will be covered on one side by two thicknesses of the cloth. As the patient will be suffering more or less from some nervous disturbance, an hysterical convulsion may be brought on by the shock if the mustard is applied cold. The surface covered by the single thickness of cloth must, therefore, be warmed by holding it in front of a fire, or in any other manner, and kept folded together until it is applied. The skin will become red in from ten to twenty minutes, and the plaster should not be allowed to remain longer, even if the patient should not complain of the pain produced by it. It would be better to reapply it in an hour or two than to blister the surface, which would cause unnecessary suffering afterwards. If the flow has come on, and the object is to relieve the backache, and to quiet nervousness, a little mustard can be mixed with ground flaxseed into a poultice, so that it may remain with safety for a longer time. To aid in bringing on the flow, I have thought dry cupping to be sometimes more efficacious, provided the cups can be applied early enough. They are to be placed on each side of the spinal processes, and confined to the immediate neighborhood of any point which may be found unusually tender on pressure. I prefer to use four or six large tumblers, since the relief is more prompt than would be the case were the same space covered with the ordinary-sized cupping-glasses. Unless the tumblers are unusually heavy and thick, there will be no difficulty in making them hold on after properly exhausting the air by igniting a little alcohol, or by saturating some cotton or a piece of paper stuck to the bottom of the glass. As I am not writing for the benefit of experts alone, the frequent reference thus to details, which may seem to be trivial in character, must be overlooked by those who may not need them. Therefore, I will add that the counter-irritation should not be unnecessarily increased by burning the patient, from either letting the ignited cotton fall upon the skin before the tumbler reaches it, or by overheating the glass before it is applied. The first can be avoided by pressing the damp cotton firmly against the bottom of the glass before dropping on the alcohol. The second by wiping off with a cloth any excess of alcohol which may have run down to the edge of the glass, and by applying the latter to the surface immediately after igniting the alcohol. From fifteen to twenty minutes is long enough for the cups to remain in one place, after which they may, with advantage, be shifted to another position.

For this form of painful menstruation, the same routine in treatment may be necessary month after month, until the local disease has yielded to treatment. During the interval between the periods, the general condition must be carefully looked after, the bowels regulated, and the skin well protected by flannel. A Turkish bath is often beneficial in its effects when taken within a week before the expected period.

From arterial congestion, the pelvic vessels may be so over-distended as to bring the lining membrane of the uterine canal, as it were, above the secreting point; and there may be an inflammation about the uterus, or a condition very closely allied to inflammation. In the condition just treated of, the organs have long been accustomed to this state of engorgement from want of tone in the vessels, but, as the veins are chiefly implicated, there exists but little tendency to inflammation.

When called to a woman who has checked her menstrual flow, by getting her feet wet or otherwise, the hot foot-bath must be used at once, and some stimulating hot drink given, to bring on a reaction. If not relieved, both in cessation of pain and a restoration of the flow, it is best to apply a dozen leeches about the anus, and a hot poultice of ground flaxseed over the abdomen, and to administer ten grains of Dover's powder with five grains of quinine, the dose to be repeated when needed. With every care, the time of the period may be passed without our having succeeded in fully restoring the proper condition, and it will then be necessary to adopt some course of treatment for her relief before the expiration of the month.

We will generally be called to treat a woman, under these circumstances, who has been in good general health previous to the menstrual check, although I am inclined to accept the check as an evidence of defect somewhere. Yet, there seldom exists a sufficient impairment to contra-indicate active treatment, and this congestive disturbance should be broken up before it becomes a habit. The temperature with this condition, when taken in the vagina, is generally about half a degree higher than it is in the axilla. Should no greater difference exist, it is good practice to apply a blister over the lower portion of the abdomen, the size of which is to be regulated according to the urgency of the symptoms. After the blistered surface has healed, if any tenderness in the vagina can be detected by the aid of the index finger, the patient must be kept quiet in bed, with a poultice over the abdomen, and the leeches again applied about the anus. This position is preferable to the neck of the uterus for leeching, since the pelvic circulation can thereby be as well influenced, while leeches cannot be applied in the vagina of a young woman without inflicting great pain and annoyance, with the risk, also, of inducing too great a loss of blood. But the chief object in selecting some other position than the neck of the uterus is, to avoid adding any additional source of irritation to this organ, already over-congested, since an increased flow of blood always takes place for a time at least to the neighborhood of leech-bites. The hot water vaginal injections should be used at night and in the morning, and iodine freely applied to the vagina and posterior cul-de-sac every four or five days. Should there have been no cellulitis or tenderness about the uterus, a sponge tent, small in diameter, but of the proper length, may be introduced two days before the expected flow. This is to be removed on the following day, the uterus washed out with a little warm water, and another tent of the same size introduced, to be withdrawn on the morning of the expected period. It is prudent that the patient be kept in bed, and all the directions observed which have been already given in relation to the use of sponge tents. The employment of sponge tents is, of course, inadmissible when there is the slightest tendency to inflammation in the pelvic connective tissue or in the ovaries. Should this condition exist, it must receive our chief attention, and we should enjoin absolute rest, and prescribe other appropriate remedies. An important measure is the judicious use of opium. We will be obliged to wait for improvement in the menstrual disorder until the more urgent complication has been removed.

The third condition is to be found when there has been an arrest of development, or, for some time, imperfect ovulation. If there has not been a sufficient cause to determine an arrest of development, amenorrhœa or a scanty flow will be established without any material change for a time in the size of the uterus. The menstrual flow becomes less or ceases, but not in consequence of failure in the ovaries to mature an ovum at the time of that special menstrual period. A change takes place gradually, ovulation having been imperfectly performed for some time previous, and without the proper amount of stimulus to emit the needed ovarian influence. Until atrophy of the organs of generation have been produced, a periodical flow of blood to the pelvis will continue to take place, in a greater or less degree, as a result of habit. Consequently, the woman will suffer with intense back-ache from the increased weight of the uterus, and from ovarian pain, also a result of the congestion.

This result is often but an evidence of an advanced stage of the second condition described, and the length of arterial congestion, or inflammatory period, varies much in different cases. At a later period, as the general health becomes impaired, but before atrophy of the uterus has come on, the pelvic veins lose their tone, and the local condition approximates closely to the one described as attending all uterine disease of long standing. As an attendant on scanty and painful menstruation, due to imperfect ovulation, the nervous manifestations are all more marked by some form of hysteria than in the first condition where the ovaries perform their function, or in the second form which is due to arterial congestion.

So long as the uterus remains of normal size, there will be a reasonable prospect for final restoration, by which the flow may become fully established in quantity, and the pain relieved. My chief reliance for the relief of this condition has been upon general treatment and the use of sponge tents just before the expected time of the menstrual period. I have generally found that the dysmenorrhœa is relieved in proportion to the increase of the discharge. For this purpose, I have employed one or two tents before the time for the flow, or I have made an application of iodine, impure carbolic acid, or dilute chromic acid to the fundus. Formerly, I have even passed up a portion of the solid nitrate of silver, and left it in the canal. All with the view of bringing on a discharge of blood as a consequence of the irritation thus established. The nitrate of silver I would not recommend, even if it were more efficient, for fear of its after effects on the os. To the use of the chromic acid, somewhat of the same objection exists, although to a much less degree, but it is an agent never to be employed if there is still to be detected any evidence of the products of a former cellulitis remaining. Under the same circumstances, the use of sponge tents would be equally admissible. But as long as any tenderness or pressure can be detected by the aid of the finger, our local means must be limited chiefly to the use of Churchill's iodine. This injunction is only applicable to a previous existence of cellulitis, but, as I have stated, it is important that this condition should not be mistaken for the extreme reflex sensitiveness found with impaired nutrition. If we are able to distinguish the latter condition, there would be no danger in the use of tents; but a few applications of iodine, with glycerine dressings afterwards, may be of service for diminishing the sensitiveness beforehand. The iodine is to be applied with the applicator, bent to the exact course of the canal, after this has been ascertained by careful use of the probe. To obtain the full benefit the cotton saturated with the iodine must be left behind in the canal until thrown out by the uterus. As soon as sponge tents can be used with safety, they should be resorted to as the most efficient means for bringing on the flow and for increasing its quantity.

The membranous form of dysmenorrhœa is to be treated locally in the same manner, and by the use of sponge-tents previous to the expected period, when even they can be borne.

As I have already stated, I believe the condition of scanty and painful menstruation, the uterus being of normal size, and the membranous form of dysmenorrhœa, to be but different degrees of the same state of general impairment by which the normal changes in the uterine membrane are retarded. By pressure of the sponge tent, or by a stimulating application to the uterine canal, before the expected period, we hasten the disintegration of its lining membrane, so that its condition is made to approach nearer to a state of health at the time when the flow comes on. It may be necessary to employ some form of anodyne to allay irritability when using the tents, but remedies of this class must be used with great care, to avoid creating the habit, and on account of their effect on the digestion. Under all circumstances, the permanent gain will be in proportion to any improvement we may be able to bring about in the general condition. Frequently the uterus is so irritable that the use of hot-water injections, with the free application of iodine to the vaginal walls, and a careful general treatment will be necessary before an attempt can be made to introduce the tents. Sometimes the patient is so run down, and in so irritable a condition, that nothing can be accomplished without an entire change of climate, and the alterative influence of a sea voyage.

For some time after the uterus has passed into a state of atrophy, a woman will often continue to suffer from backache, as has been stated, at the time when the flow should make its appearance. I have but little faith in the use of local means for the relief of this condition, and there is a limit even within which any improvement in the general health will benefit the local condition.

Electricity has apparently been beneficial sometimes in bringing on the flow and in relieving the pain caused by the suppression. But the application has been empirical in my hands, since, under apparently similar circumstances, the interrupted current seemed sometimes to answer, when the constant one had no effect. Sometimes the reverse of this would be true, and in turn both currents would fail. Electricity, in any form, has usually a tonic influence, acting apparently on the general system, with very little local effect, at least in diseases of women. Beyond this my experience does not warrant a more decided opinion as to the best mode by which the agent should be used.

CASE I.—About two years and a half ago, I was consulted in reference to the condition of a young lady in this city, with the following history: During childhood she had been, as it was termed, rather delicate, but always free from any special difficulty. She was remarkably quick and intelligent as a child, with a great fondness for study. She began menstrual life at fourteen years of age, apparently under auspicious circumstances, with the flow lasting three days and free from pain. But, as a consequence of over-study, I have every reason to believe, the menstrual flow became scanty, painful, and irregular, since the ovaries and uterus had become blighted before she had reached the age of fifteen. For nearly three years she had been traveling about, with great improvement to her general health. But there had been no return of the menstrual flow, except when it so happened that the period was passed at sea. Yet she had frequently suffered, at other times on land, when the flow should have come on, from a dragging feeling in the back, and one of fulness about the pelvis. She was eighteen years and a half old when I first saw her, and her uterus was only two inches deep. I could discover no special condition likely to be benefited by local treatment, so requested Dr. Rockwell to take charge of her, and try the efficacy of electricity. No direct application was made to the uterus, but the current was formed by placing one electrode over the lumbar region or sacrum, and the other on the lower portion of the abdomen. This treatment was continued for some five months, and, I believe, three times a week, until June 28, 1875, when she menstruated naturally for two days. I made an examination shortly afterwards, and found that the uterus had acquired its normal size. The treatment by electricity was shortly afterwards modified as to frequency, but was still administered sufficiently often to keep up the normal size of the uterus. But, I believe there was only one natural effort afterwards, since which she has never menstruated except while at sea. In the mean time, it had been so arranged that she should sail a day or two before a menstrual period, and return home at the end of one month, so that she should pass two consecutive periods at sea. This has been done three times, and in each instance the flow has come on naturally, with but little pain, and has lasted two or three days, but there has been no show at home. She remains in very fair general health, but at times is listless and unable to interest herself in any subject without making an effort. Her general appearance is that of a girl of sixteen, and she has a vagina so small that I would have been reluctant to make an attempt to introduce a sponge tent, even if the necessity for one had been imperative. As she herself has wished this mode of treatment deferred, it has not been urged, and the case is cited chiefly to show the effects of a sea-voyage in such cases, and this one is not unique, since I have known of several other like instances. Among emigrants, however, a contrary effect is produced by the sea-voyage, amenorrhœa being a common condition for several months after their arrival. In the first case, nutrition being at fault, the impression produced by the sea air and motion is beneficial; but with the emigrant, who is generally in good health, the nervous system is fully occupied, from the first, in counteracting the deleterious effects arising from anxiety of mind, a new mode of life, and the privations to which emigrants are too often subjected.

Vicarious Menstruation.

It may be reasonably supposed, as habit plays so important a part in organic life, that from this influence a flow of blood to the pelvis would take place at regular intervals, in correspondence with what should be the menstrual period. Yet, there must be a limit to this influence, and the supposition is a rational one that the period is due to ovarian excitement, so long as the uterus remains of a normal size. When the uterus does remain of a natural size, and the menstrual flow does not take place at the regular period, we can but suppose that the fault lies in the uterus itself. With our present limited knowledge, we must confess our ignorance as to the cause, and can only renew the supposition, already advanced, that this escape of blood cannot take place until the uterine lining membrane has undergone the requisite change. If this were proved true, we would still have to seek an explanation as to why this change does not take place or is delayed, and can only conceive the omission to be due to faulty nutrition. When the walls of the pelvis have become over-charged with blood, rupture of a vessel, as in the formation of hematocele, would take place, if no other outlet were offered. Under the circumstances, it is supposed that this state of recent congestion causes a sufficient local irritation to bring about a reaction. The consequence is, the excess of blood is thrown back upon some other organ or portion of the body, for an outlet, and its escape at the menstrual period, by an unnatural channel, is termed vicarious menstruation.

An unnatural escape of blood may thus take place from the mucous membrane of any portion of the body, or the pressure on the circulation may be relieved by an unusual increase of the natural secretion from some organ. But we are ignorant by what law the selection is regulated, so that bleeding of the nose, or hemorrhage from the stomach or lungs may take place with some individuals, while with others there will be a profuse serous diarrhœa. The occurrence of diarrhœa at this time is common, and the escape of blood from hemorrhoids equally so with some women, who suffer from a scanty menstrual flow ; and the explanation is a simple one when we consider the connection between the pelvic circulation and that of the mesentery.

During the temporary suppression of the menstrual flow, from any cause, the occurrence of diarrhœa is often observed at the time when the flow of blood should have taken place. An increase of leucorrhœal discharge from the vagina is equally common, and is easily understood to be an effort of nature to relieve the pelvic congestion by a ready outlet, as from a safety-valve. But why, instead of these, the brain or vessels of the spinal column should sometimes bear the brunt, or a periodical hemorrhage occur from the stomach, with no evidence of local disease, cannot be so readily explained.

The treatment of vicarious menstruation must depend, in a general way, on circumstances. But our chief efforts must be directed to correcting the local condition, that the current may as soon as possible be turned into the natural channel, before the serious complication of a bad habit becomes fully established.

HYSTERIA.

The various nervous manifestations which are grouped together under the term Hysteria are all, as a rule, intimately associated with some menstrual disorder. These nervous manifestations are generally found in the unmarried and sterile, and at puberty, before the system has become impressed with the menstrual habit. They also occur with the state of ammenorrhœa or suppression, scanty and painful menstruation, and at the change of life. These conditions are associated, more or less, with a general impaired nutrition and defective ovarian influence. Hysteria is supposed by many to be caused directly by ovarian irritation, but while granting that hysteria and ovarian disorders generally do coexist, I am not disposed to admit a necessary relation of cause and effect. The state of ovarian irritation, or defective action, and the different nervous disturbances are equally affected by faulty nutrition, as well as the various conditions enumerated above, and all spring from defective action in the nerve centres.

This subject, as to supposed cause and effect, together with the general treatment, has already been considered. It is only necessary to state, in addition, that after the shock or morbid impression has been once made on the nerve centres, it requires but a slight exciting cause to bring on, at any time, these nervous manifestations, until the general tone has been improved. Defective nerve force would necessarily associate hysteria with the various conditions cited; and the continuance of a local difficulty, depending on any of these conditions, may eventually, by reaction on a susceptible nervous system, excite, at any time, the nervous manifestations. The treatment of hysteria consequently can be but palliative, and it is necessary to combat its symptoms as they may be presented, from whatever provocation, in order to restore the general and local condition to a normal standard.

Experience has taught us that a threatened attack of hysteria may often be aborted, or, if already under way, may be greatly mitigated by getting rid of the sudden generation of flatus in the large intestines. This accumulation is the result of reflex irritation readily excited from the close connection existing between the nervous system of the organs of generation and the intestinal tract. The usual mode of treatment is to administer, by injection into the rectum, the greater portion of the contents of a basin of hot water, to which has been added an ounce of the tincture of assafœtida. But to cut short the attack, it is absolutely necessary to rouse the patient by some powerful moral impression, through which the physician will be able to control her, and as she will remain deaf to all reason, the influence can only be gained through fear or by exciting her indignation. Between two paroxysms, the patient will generally be lying exhausted, with her head near the edge of the bed, and apparently unconscious. I seize this opportunity to mix the assafœtida by stiring it up thoroughly with the hot water in close proximity to her nose. As she shifts her position to avoid it, the basin must be moved accordingly, until vomiting is induced, or a protest is called forth to the indignity thus offered. I then propose a compromise, to remove the cause of offence if she will make the effort to control herself; but on the slightest evidence that an attack is about to come on, the mixture is held to her nose until the threatened paroxysm subsides, even if she has to inhale the odor for hours. I then have her placed on the left side near the edge of the bed, with her lower limbs flexed, as if for the purpose of having the speculum introduced, and the injection is administered. It is advisable to fill the whole colon, that the bowels may be thoroughly moved, and the flatus all absorbed by the water, or passed off. By placing the patient in this position, a much larger portion of the injection can be introduced than in any other way, before she will feel any inconvenience. The injection must be thrown in slowly, and when, apparently, the patient is unable to retain more, a kind word of encouragement will aid her in resisting the effort of expulsion. The nozzle of the syringe must then be withdrawn, and firm pressure be made over the anus by the palm of the hand against a napkin rolled up and placed between the limbs. Pressure thus properly made will aid the patient in resisting the desire to evacuate the bowels, which should be delayed as long as possible. As the patient is exhausted, it is best that the bowels should be evacuated on a bed-pan, since the exertion of getting up might bring on another attack, notwithstanding her efforts to resist it. By the time the colon has been emptied, the skin will be acting well, and the patient, although thoroughly tired out, will feel relieved. The action of the skin should be kept up by extra bedclothing, and the patient allowed to sleep. When the physician is called early enough, he may sometimes prevent a threatened attack by placing a mustard plaster along the whole length of the spine, and giving a dose or two of the valerianate of ammonia and some good advice as to her responsibility. On the other hand, the attack may have advanced so far that the patient is no longer able to make any exertion, and it would be necessary to apply the mustard to the spine and inside of the thighs, before the injection could be administered. Sometimes the convulsions are so severe or frequent, it becomes necessary to administer an anæsthetic, so that, while under its influence, the hot water and assafœtida may be thrown into the rectum, when also the mustard may be applied.

When the colon is distended by hot water, this reflex irritation is always relieved with more promptness than if the water were thrown into the vagina, while the assafœtida has also a soothing effect, and both agents excite the muscular fibres to contract with more tone, and to resist afterwards, for a time, the accumulation of flatus.

It is probable that the rapid generation of flatus, which will sometimes take place within a few seconds, is excited by the same irritation causing the hysterical attacks. We, however, learn from observation, that the severity of the paroxysms is always in proportion to the degree of accumulation, and that their occurrence can be controlled by insuring a free escape of flatus, while relief is obtained when the colon has been thoroughly emptied.

It was formerly my practice to have a rectal tube introduced by the nurse as soon as an attack was threatened, and I have often witnessed an effect analogous to that claimed from opening the trachea, by which the free passage of air arrests an attack of epileptic convulsions. When the rectum happens to be free from feces, on introducing a large flexible tube to or beyond the sigmoid flexure, I am often amused at the suddenness with which all preparations for an attack cease. As soon as the patient gets herself in position for an attack, and tightens the abdominal muscles, a free escape of flatus takes place from the tube without the slightest warning, and the effect is that she lies quiet, fearing to move, and her face, if she is conscious, expresses no little surprise.

Case II.—Several years ago I was present on such an occasion, in my private hospital, where a young lady had been lying in apparently an unconscious state, after an hysterical convulsion, and had taken no notice of my presence, although I felt satisfied that she was aware of it. The nurse had just introduced the rectal tube as I entered the room, and the patient began an attack shortly afterwards for my benefit. She suddenly threw herself in the position of opisthotonos, but before her head and feet could be brought under her, a loud escape of flatus took place from the tube, and continued with a steady rhythm but lowering note for several seconds, as she gradually straightened herself out, and the colon became empty. I was in a position to see her as she opened her eyes, and the appearance of astonishment and mortification depicted on her face, as the flatus continued to escape, was intense. I quietly asked if she had lost all the delicacy of her sex, in making such an exhibition before me, when she burst into tears and covered her face. She had, before coming under my care, been very willful, and had had these attacks of hysteria frequently, often tearing the bedclothing and her nightgown. But they were never repeated, as she was assured by the nurse that the instrument would again be introduced if she showed any symptoms of another seizure, and after that she would have to continue wearing it, so that the wind might escape all the time. Through this fear, she began to exercise her self-control, and the impression thus made on her mind was the turning point in her case towards recovery.

CHAPTER XI.

CONGENITAL ABSENCE AND ACCIDENTAL ATRESIA OF THE VAGINA; MODE OF OPERATING FOR ESTABLISHING THE CANAL, AND FOR EVACUATING RETAINED MENSTRUAL BLOOD.

Causes of retention—Mode of relief—Table XIII., exhibiting cases of imperforate hymen, congenital absence of uterus, and accidental occlusion—Cause of death when the uterus has been emptied of its contents—Proper mode of treatment—Cases.

THE retention of menstrual blood within the uterine cavity results from congenital or accidental causes.

Causes of retention,	Congenital,	Absence of the vagina, Imperforate hymen.
	Accidental,	Closure of the os uteri, “ “ “ vagina.

A young girl may reach and pass the average age for puberty, apparently in full physical development, and yet without any appearance of the menstrual flow. The history given will be to the effect that a year or two previous to seeking advice all the rational signs of approaching menstruation had been recognized. Month after month these symptoms presented themselves with marked periodicity, but without a show until, at length, the backache and sense of pressure on the bladder and rectum had become constant. Recently, however, these symptoms may not have presented themselves with as much regularity, but with a marked increase of nervous disturbance; her general health will have already begun to suffer, and in all probability some symptoms of blood poisoning may be detected at the first examination.

On the other hand, with many of these symptoms presenting, there may be less inconvenience from pressure on the bladder or rectum, but with a marked increase in the nervous disturbance.

It is of the greatest importance to investigate the condition of a young girl presenting these symptoms, without delaying until her general health has begun to suffer. The chief point to be established by an examination is whether or not there exists retention of the menstrual blood, for without this knowledge we cannot be sure of the proper course of treatment. The retention should be recognized at as early a day as possible, since the immediate beneficial results from any operative procedure will be in proportion to the distension to which the uterus has been subjected. When the retention has resulted from an imperforate hymen, delay is unnecessary, although, occasionally, nature brings relief by rupture of the membrane. With congenital absence of the vagina, a resort to some surgical interference is absolutely necessary for relief, if an accumulation has taken place. Nature guards against rupture of the uterine wall by an increased thickness, as during pregnancy; the original parietes of the organ are not made thinner by the distension. As a result of delay, the patient becomes exposed to two dangers: dilatation of the Fallopian tubes, it is said, may occur by their becoming filled with the contents of the uterus, and they may either rupture or allow of the escape of the fluid into the peritoneal cavity. The second and chief danger is from blood poisoning. There is also a risk from inflammation, in consequence of the fluid being forced through the tissues of the uterus without actual rupture. Dr. Barnes,[1] after referring to some experiments by Dr. Mathews Duncan, showing that under hydraulic pressure, air and liquids penetrate the uterine wall, writes: "But it appears to me that there is good reason to believe that the force which the living uterus exerts in its efforts to expel what may be in it, whether it be a fœtus or imprisoned fluids, is enough to drive fluid through its walls, in the form of a fine oozing, or dew, which hangs on the peritoneum. It seems to me probable that it is in this way that some cases of puerperal pelvic peritonitis are produced; and I have seen cases of septicæmia and peritonitis occurring from retention of menstrual fluid, greatly resembling puerperal fever, in which there was no rupture, and no escape of fluid by the open ends of the Fallopian tubes."

In the absence of the vagina, it is proper to open the canal at an early age, even if no retention exists, or if a vestige of the uterus can be detected. A case will be cited showing that nature had evidently delayed the development of puberty in consequence of there being an occlusion, although this is not the rule. Another instance will be given in which the uterus became developed, after failure of the operation to disclose any trace of the organ. In two other instances, the health became established after the operation, although no development of the uterus took place afterwards, and this remarkable circumstance has also been noticed by Dr. Barnes.

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[1] A Clinical History of the Medical and Surgical Diseases of Women, by Robt. Barnes, M.D., p. 181.

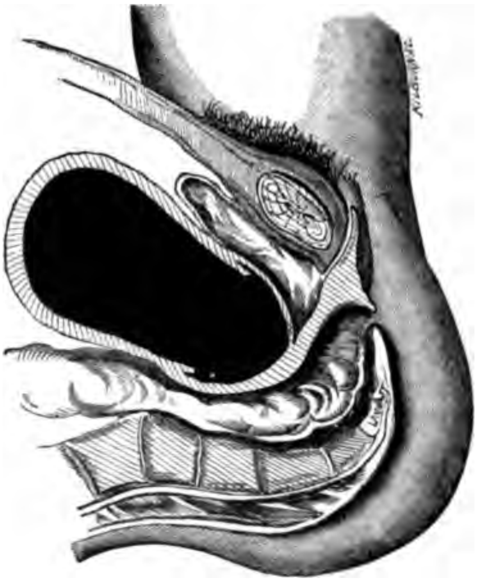
For the examination, the patient must be placed on the back, with her limbs flexed, and the body within easy reach of the operator. By passing the index finger into the rectum, it will be easy to satisfy one's self from the size of the uterus, if developed, as to the probability of retention within its cavity. This, however, we must not assume, without further examination, if the vagina be developed, since pregnancy has sometimes occurred before the appearance of menstruation. Should the uterus be felt in position, and nearly of a normal size, it will not be necessary to extend the examination beyond separating the labia for the passage of a probe to a sufficient depth to ascertain that the vagina is pervious. Under these circumstances we may assume that the delay in the appearance of the menses is due to some fault in the general system, and we must first resort to means for relieving that condition.

We shall be able, as a rule, readily to distinguish the absence or a defect of the uterus from a want of development as to size only. At a point somewhat lower than that usually occupied by the cervix and vaginal junction, the finger will come in contact with a well-defined crescentic ridge, or band, extending across the pelvis in the direction from one ovary to the other. The sensation conveyed to the finger will be that of a sagging of the broad ligament or other structure in the space, which would have been occupied by the uterus if it had been present. After introducing a steel sound into the bladder, the extremity of the instrument can be easily brought into contact, along this crescentic band, with the finger in the rectum, which could not be done at this point were the uterus in position.

According to Kussmaul and others it rarely, if ever, happens that the uterus is entirely wanting, and they hold that a post-mortem examination will always reveal some vestige or rudimentary portion of it. The correctness of this statement I cannot verify or disprove by post-mortem observation, but I have seen six cases or more of congenital absence of the vagina where, after the most careful investigation, it was impossible to detect the slightest trace of the uterus.

When the accumulation is confined to the uterine cavity, the elastic body, as felt from the rectum, will be nearly globular in shape. But the most common form met with is the one shown in Fig. 42, where a portion of what is a recto-vesical septum is also distended. No portion of the vaginal canal is open, but the tissue which presents at the os is, when this becomes dilated, crowded off and put on the stretch, as the fluid continues to accumulate. It is sometimes stated by writers, that the uterine cavity does not become dilated when the accumulation has been caused by an imperforate hymen. The correctness of this statement depends upon the extent of accumulation, since the uterus must become dilated by the backing up of the fluid as soon as the vagina becomes over-distended, or if there should be no other outlet.

Fig. 42.



Absence of vagina, and retained menstrual blood.

With young girls who have never had a menstrual show, the obstruction is usually a congenital one, due to a want of development of the vaginal canal, in whole or in part; or the retention may be caused by an imperforate hymen. There are exceptions, however, to this rule, for instances are not uncommon where the vagina has become closed up in childhood, from some injury or from inflammation of the mucous membrane. The first condition is a consequence of the introduction of some foreign body into the canal, by which sloughing and contraction followed. Of this form of injury an instance will be cited, where the passage was destroyed in a young child by her falling on a dead branch of a tree, which entered the vagina and penetrated into the abdominal cavity through the posterior cul-de-sac. The second condition, as a consequence of inflammation of the mucous membrane, may be produced by exposure to cold or neglect of cleanliness. But this form of adhesive inflammation seldom extends throughout the canal, and, unless sloughing has occurred, it does not offer so persistent an obstacle to the final escape of the fluid which may have been retained by it; but it frequently leaves the passage constricted.

The external portions of the organs of generation are generally well formed, but on exposing the vulva, the orifice of the urethra will be found rather lower than natural, and at the bottom of a shallow sulcus, and there will be no appearance of a vaginal outlet. In absence of the vagina, the urethra is always unnaturally relaxed, but the power of retention of urine remains uninjured. I have placed on record[1] a case of this description, where a young woman, after having been married several years without a menstrual show, consulted me for the latter difficulty. I found not the slightest evidence of the existence of a uterus nor trace of the vagina, but I discovered that connection had been carried on through the urethra into the bladder, without either husband or wife having suspected the true condition.

Accidental occlusion of the vagina is a frequent consequence of child-bearing, from sloughing caused by long-continued pressure at some one point, or throughout the canal. Strong injections of the nitrate of silver and other agents, as used formerly for the treatment of leucorrhœa, have frequently caused closure of the passage by adhesive inflammation. By the application of various caustics to the upper portion of the vagina, and particularly by the use of the galvano-cautery for amputating the cervix, the os becomes closed, with retention of menstrual blood following.

Unless the injury is received at an early age, it seldom happens that the passage becomes destroyed throughout its course, from any accidental cause, or that the vaginal outlet ever becomes so entirely changed as to present only a shallow sulcus between the labia, as in congenital absence of the vagina. Some aid may be gained for forming a diagnosis from the thickness of the septum between the bladder and rectum, and this is to be ascertained by means of a finger in the rectum and a sound in the bladder. In the congenital form, the septum will be found as thin as the recto-vesical one in the male, since there has been no development of the muscular and other tissues forming the vaginal wall. But after the vagina has been once formed, and the uterus has for a while performed its functions, the vaginal wall will remain, after accidental occlusion, even thicker than before, so that there will be little difficulty in forming an opinion, even if the presence of the uterus could not be detected. Under ordinary circumstances, there can be but little difficulty in forming an accurate idea of the true condition. In the absence of a vagina, with accumulation, the condition might be complicated by the occurrence of a hematocele or a collection of pus in the pelvis, but a careful investigation of the case will remove all such difficulties of diagnosis.

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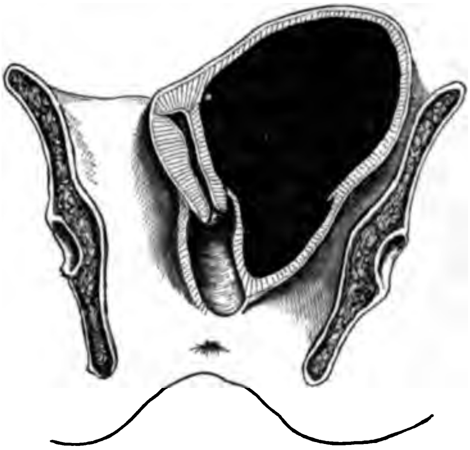
[1] Vesico-vaginal Fistula from Parturition and other Causes, etc., p. 229.

But it may sometimes be almost impossible, except after frequent examination, to determine the exact condition where a double uterus exists with a single vagina, or a double uterus and double vagina, as seen in Fig. 43. Some years ago, I was consulted by a woman about nineteen years of age, who had never menstruated regularly, and wished relief from a sense of pressure and bearing down which had existed for several years. She was exceedingly nervous. I had great difficulty in completing a thorough examination, and was not a little puzzled to make out a diagnosis. To the left of the vagina there was felt an accumulation of fluid extending as high as the finger could reach, and from the rectum an elastic and nearly globular body could be felt closely attached to the uterus. After satisfying myself as to the position of the fluid and its connection with the uterus, I unfortunately proposed to introduce an exploring trocar to ascertain the character of the accumulation. It seemed I had already lost my patient's confidence from the length of time I had taken to form an opinion as to what her difficulty was, so that my proposition was

Fig. 43.



Double uterus and double vagina, with retention.

refused on the ground that she would not be experimented with any longer; I never saw the case again, and know nothing of her subsequent history.

Owing to my connection with the Roosevelt hospital, I was recently called into consultation to see a case in the institution under the charge of Dr. Watts, one of the visiting physicians. In this case there were two vaginas, but the uterus, or uteri, only opened into the passage where the accumulation took place. The other canal lay in the median line, and terminated above in a cul-de-sac, and was the one by which sexual intercourse had taken place, since the mouth of the vagina which led to the occluded uterus was exceedingly small and to one side, and was only detected by accident. The patient was not aware of her condition, but had consulted Dr. Watts for the removal of her sterility. Dr. Watts afterwards operated by dividing the septum and converted the two passages into a single one. There existed sufficient similarity between these two cases for me to assume that the condition represented in Fig. 43 as that of my patient was a correct one for both. There existed a double uterus and vagina, with one canal closed, as if from an imperforate hymen. She was not regular as regards an external flow of blood, since she never had a show with a less interval than two months, so that it is likely the two uteri menstruated alternately.

Unless the retention be due to an imperforate hymen, or to some slight barrier resulting from adhesive inflammation, nature is powerless to relieve herself. All writers agree as to the danger attending a long retention of the menstrual fluid, and are equally in accord as to the risk to life for the woman from any procedure instituted for the purpose of evacuating the contents of the distended uterus.

In consequence of the many fatal results which followed the early operations for making a vaginal tract, more recent operators have resorted to tapping the uterine cavity with a trocar from the rectum, and various modifications of the instrument all have reference to excluding the air. But experience has demonstrated that the danger to the patient is equally great after tapping from the rectum, and as the procedure cannot give permanent relief, the operation for opening a vagina is now received with more favor. But it is now generally considered advisable that the canal should not be completed at once, and that the opening should be a very small one, so that the contents of the uterus may be drawn off slowly, in order to guard against the fluid being forced by uterine contraction through the Fallopian tubes into the abdominal cavity. My own experience has taught me to follow a course entirely at variance with that recommended by the best authorities, which is essentially the same as that adopted by the early operators.

In the *London Lancet*, August 13, 1831, a review is given of a recent work[1] by Mr. R. Fletcher. Among other operations, one is cited for opening a passage to the uterus in a married woman twenty-two years of age, who had never menstruated, and where sexual intercourse had taken place through the urethra. It is stated that after the first cut, made with a scalpel to the depth of some two inches, fearing to continue by that method, he introduced into the wound a large rectal bougie, which he advanced from time to time by taps from a mallet. "In about a week, repetitions of this practice of tapping succeeded in reaching what proved to be the uterus, which was perfectly formed, and in a healthy condition." This woman soon afterwards menstruated, and at the time of recording the case she had already become the mother of two children.

This novel method of opening a passage does not seem to have been repeated, yet, from the character of the tissue, which separates so readily, between the walls of the bladder and rectum, the method is one which might be resorted to with advantage. When the septum is thin, by steadying the parts with two fingers in the rectum, the bougie will encounter less resistance from the cellular tissue than from the walls of either cavity. But the operation could have been completed, with less risk to the patient, in as many minutes as he occupied days for the purpose.

Amussat,[2] in 1832, operated on a girl between fifteen and sixteen years of age, who had suffered for two years from retention. He abandoned the use of the knife after getting through the skin, for fear of entering the bladder or rectum, and separated the tissues by the aid of the nail and finger. After a little advance, the wound was packed with sponge for three days, when the tearing process was again resorted to, and the wound refilled with sponge. After three attempts, the tumor was reached on the tenth day and emptied by a trocar and bistoury. She suffered from inflammation of one of the Fallopian tubes, and after being relieved four times from retention, the canal finally remained sufficiently open.

Previous to the date of my first operation, a few isolated cases are reported where efforts for relief had consisted in tapping from the rectum, or in following the plan adopted by Amussat for opening a passage to the uterus. These cases were chiefly for accidental closure, and in every instance the operation was extended over several days, and the evacuation made through a small opening.

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[1] Medico-chirurgical Notes and Illustrations, part 1st.

[2] Gaz. Médicale de Paris, 1835.

Table XIII. exhibits the cases of imperforate hymen, congenital absence of the vagina, and accidental occlusion, with retention, which have passed under my observation.

TABLE XIII.—*Cases of Retention due to Imperforate Hymen, Congenital absence of the Vagina, and accidental Occlusion, with results of Operation.*

Cause of retention.	Remarks.	Result.	Private Hospital.	Woman's Hospital.	Total.
Imperforate hymen.	Retention from one to two and a half years.	Relieved.	4	......	4
Congenital absence of the vagina.	....	All relieved. Case in Woman's Hospital had cellulitis.	2	1	7
Congenital absence of the vagina.	No uterus found after the operation.	Uterus subsequently developed, and menstruation became normal.	......	1	
	No uterus found. Two married and one single.	There was no menstruation, as the uterus never developed.	2	1	
Atresia of the cervix from childbirth.	....	All relieved. One case had cellulitis.	3	6	9
Atresia from traumatic injury.	....	Relieved.	1	......	1
Atresia from amputating the cervix uteri with the galvanic cautery.	Menstruation retained several times, necessitating several operations.	Relieved only temporarily; atresia returned.	1	......	1
		Total number of cases..................	13	9	22

I have only met with four cases of retention due to imperforate hymen. It was impossible to determine with any accuracy the time at which the accumulation began, for in the case which had suffered, as it was supposed, for the longest period, the amount of retained fluid was less in quantity than in another in which the retention had existed less than a year. There can be no doubt of the fact that the pouring out of the first menstrual flow is delayed as long as possible when an obstacle exists to its free escape (as if nature recognized the necessity), and after it has become established, the quantity is never so great with a congenital obstruction, as when one is formed by accident, later in life. My impression is that the average accumulation in these cases was about six ounces. I divided the hymen with a sharp-pointed bistoury, and then freely enlarged the incision with my index finger. As soon as the collections had escaped, I washed out the vagina and the partially dilated uterus thoroughly with warm water, by means of a Davidson's syringe. A small glass vaginal plug was then introduced, and removed night and morning for the purpose of having the vagina syringed out. These cases received no other treatment, except to be kept quiet in bed seven or eight days, and they all recovered without the slightest disturbance. But for the fact that cases have been placed on record where death has resulted from this simple operation, I should have regarded the procedure as being worthy of little more than a passing recognition.

By reference to Table XIII. it will be seen that there were seven cases of congenital defect in the vagina: six with entire absence, and one with a transverse septum higher up, as if it were a second hymen, about an inch from the outlet. There existed retained menstruation in two cases where the vagina was wanting, and in a third where the septum higher up acted as the barrier. The fourth case of absence of the vagina was sent to the Woman's Hospital after an unsuccessful attempt had been made to open the passage. The operator had cut through a portion of the urethra into the bladder, so that the woman had no longer any retentive power. The record of this case will be given hereafter, and is one of particular interest on account of the uterus having been developed after the opening of the vagina, and after our having failed to detect the existence of the organ, even in a rudimentary state, prior to the operation. Not the slightest vestige of the uterus could be detected in the remaining three cases of congenital absence of the vagina, nor was there subsequently any effort of nature to develop the organ, even if it did not exist in an undeveloped state.

Nine cases of accidental atresia, following difficult labor, with retention of the menstrual flow afterwards, have passed under my observation. The history of the only case belonging to this class of injuries which presented any unusual difficulty will be given to illustrate the mode of treatment, and to establish the date of instituting it.

The history of the remaining case of accidental atresia, resulting from a traumatic injury received in childhood, by which the whole canal was destroyed, and puberty delayed in consequence, will be given also.

Early in 1863 I received in my private hospital a patient, 16 years of age, who had been suffering for a year previous with all the symptoms of retained menstruation. At the first examination I ruptured the hymen without difficulty, and just beyond it I reached a thin septum through which I could detect the evidence of fluid by making pressure with a finger of the other hand in the rectum. This was my first case of the kind, although I had seen one not unlike it in the Woman's Hospital in which the fluid was evacuated by Dr. Sims[1] through a small opening, and the vagina enlarged by an operation a few weeks subsequent. I placed the patient on her side, and introduced the speculum until the septum was brought into view, when, the surface being steadied by means of a tenaculum, I cut through it with a pair of scissors. The patient was then turned on her back, and as the blood escaped I forced my finger through the opening until the septum was broken up. As soon as the flow of blood lessened, I had a bedpan placed under her, and then washed out the vagina and the dilated uterus with warm water until the water returned clear. A glass plug, or dilator, of a proper size, was introduced, she was not allowed to get up for ten days, and had no further treatment beyond the vaginal injections of warm water morning and evening.

This was not only my first case of retention, but the first also in which I made a free opening, and employed warm-water injections to wash away the blood from the interior of the uterus and vagina. I followed the course which seemed to me based on sound principles, without the knowledge, at the time, that the mode of treatment was not the accepted one. Amussat was about the only authority who had written from any experience, and if I had then been familiar with his views they would, in all probability, have had but little weight, since his course was well fitted for exciting inflammation and blood poisoning.

Shortly after treating the above case, another with retention from imperforate hymen came under my charge, and she also was relieved in the manner described. I unfortunately did not, at the time, appreciate the importance of the operation, and failed to place it on record, but at a subsequent date I reported[2] the three following cases, on which may be based my claim for a mode of treatment which additional experience has now shown to be most successful.

CASE III.—Mrs. B., of Newark, N. J., was admitted to the Woman's Hospital, April 27, 1863, with a vesico-vaginal fistula following her first labor of five days' duration and forceps delivery. Although three years had elapsed since her confinement, there had been no return of menstruation, and, with extreme prostration of the nervous system, her general health had become much impaired. On introducing the finger between the labia, at the depth of less than an inch, it passed directly into the bladder, through a transverse fissure situated at its neck, about two inches in length. From the posterior margin of the fistula, the vagina was entirely occluded. Nothing definite was gained by a rectal examination beyond the fact that pelvic cellulitis had previously existed, and the position of the uterus could not be detected.

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[1] Reported in Clinical Notes on Uterine Surgery, p. 337.

[2] Accidental and Congenital Atresia of the Vagina, etc., read before the New York Obstetrical Society, June 19, 1866, and published in the Richmond (Va.) Medical Journal, August, 1866.

May 10. With the patient etherized and lying on the back, two deep incisions outwards and downwards were made on each side of the fourchette, through a dense cicatricial band, involving this portion of the vaginal outlet. By an assistant, the posterior edge of the fistula was seized by means of a tenaculum, and being drawn upwards in the direction of the pubes, was put on the stretch. The vaginal tissue was then carefully divided laterally with a scalpel, in the supposed direction of the uterus. As the canal was opened up, the thumb of the left hand of the operator was advanced to put the posterior wall of the vagina on the stretch by pressure backwards, and with two fingers of the same hand in the rectum as a guide, the relative thickness of the rectal septum was preserved. A depth of nearly five inches was gained, when the hemorrhage became so excessive that a further attempt to reach the uterus was abandoned. A hollow glass plug, five inches in length by two in diameter, was introduced and retained *in situ* by a perineal bandage. The patient was placed in bed, and opium administered, after the effects of the ether had passed off. For several days she suffered much from constitutional disturbance, irritability of the bladder, and a feeling of soreness over the lower portion of the abdomen. Retention of urine resulted in consequence of the pressure exerted, and, without removing the plug, the bladder was emptied by means of a gum-elastic catheter. As the plug had controlled the hemorrhage, it was not taken out for several days, until loosened by suppuration, and afterwards large vaginal injections of tepid water were used daily until her discharge. At the end of ten days, it was found that absorption of the tissue had gradually taken place by pressure of the vaginal plug, until the cervix could be felt through a thin septum, a little to the left and about four inches from the mouth of the vagina.

June 3. The septum was caught up on a tenaculum, and divided by scissors; the vagina, which had been closed throughout by adhesions, was thus opened, with the exception of a small cavity immediately around the cervix uteri, into which the latter protruded uninjured.

26*th*. The artificial vagina being now properly healed, the edges of the fistula were pared by scissors, and approximated with eight interrupted silver sutures. The edges of the fistula were sloping, as is usually the case when situated at this point, and, although two inches long on the vaginal surface, receded until the actual length of the opening was not more than half so much at the entrance to the bladder. On the ninth day the sutures were removed, and, with the union perfect, she was discharged cured, July 15.

Oct. 8. She was re-admitted to the hospital, in consequence of a gradual closure of the vagina. It was found that the original condition of atresia existed to the posterior edge of the closed fistula, which, however, had remained intact, with perfect control of the urine. On the next day, the previous operation was repeated, until the os was again reached, and a glass plug of the same size introduced. During the night, she had a violent chill, followed by an attack of pelvic cellulitis. The plug was removed, and at the end of two weeks she recovered, with closure again of the vagina nearly to the original condition.

Nov. 8. She was examined, and it was found that about an inch had been gained. At the bottom of this canal, nearer to the base of the bladder, a small opening was detected, only large enough to admit an ordinary probe. After passing some two inches, its point could be felt from the rectum, in the neighborhood of the cervix uteri. A straight, blunt-pointed bistoury was passed along the probe as a guide, and on withdrawing it, an incision was made in the median line, to the depth of half an inch, directly through this septum, on the support given by the index finger in the rectum. A similar incision was made laterally to the right and left, thus again opening the canal to the cervix uteri, so as to admit a plug nearly two inches in diameter. The hemorrhage was so great, that it became necessary to remove the plug, and introduce a larger one into the rectum; this kept the cut surfaces in contact, and controlled the hemorrhage. The opening, however, gradually contracted, although vaginal plugs were used as soon as it was safe to introduce them.

Dec. 5. The small sinus which still existed was dilated by a sponge tent, so as to admit the index finger, and free incisions were again made through the septum, for three inches in length.

Jan. 9, 1864. She returned home to recover her health, having just menstruated for the first time since her pregnancy, after an interval of nearly four years. The vaginal surface had become well healed over the plug, which had been in use since the operation, and which was only removed at the time of receiving the daily injections of tepid water.

May 25. She was again admitted, suffering from constant pain and a feeling of fulness in the pelvis. There had been no menstrual show since leaving the hospital, although the nisus had been regular. The use of the plug had been continued, until gradually it became impossible to introduce it without great pain. The canal was again closed. Through the rectum a mass, slightly fluctuating, was detected filling up the pelvis, and, with the other hand over the abdomen, the uterus was felt enlarged nearly to the umbilicus. As it was near the regular time for menstruating, she was kept in bed and under the influence of opium.

June 6. In the presence of some of the members of the American

Medical Association, a trocar was passed from the vagina through the septum, which was, in consequence of the accumulation behind, only an inch in thickness. More than a quart of retained menstrual fluid was evacuated, with great relief, the opening was enlarged, and the cavity of the dilated uterus washed out by injections of tepid water.[1] After ten days the discharge all ceased. With the septum so thin, and having been freely divided, every hope of success was anticipated in keeping it open permanently. In July she was discharged, after menstruating freely, and with her general condition much improved.

She returned to the hospital December 2d, after menstruating each month with increasing pain and difficulty. Through the septum, a little over an inch thick, a small sinus still remained, but only large enough to admit a probe. Its tract was somewhat enlarged by a bistoury, and four ounces of retained menstruation evacuated. She was placed under ether, and after introducing two fingers of my left hand into the rectum well behind the mass as a fixed point, the index finger of the other hand was forced with much difficulty through the small opening. The canal was opened by laceration, by the addition of one finger after another, until almost as much was thus gained as had been previously done by means of the knife. The hemorrhage was slight; she was kept in bed for a week, partially under the influence of opium, without any bad symptoms following the operation. Early in January, 1865, she was discharged.

Feb. 23. She reported herself for examination, after menstruating twice without pain. The vagina was now four and a half inches deep, the surface well healed, and with but little discharge. She was directed to continue the use of the glass plug for some time.

I lost sight of the case until May 23, 1866, when she visited the hospital. She was in perfect health, regular, and living with her husband happily. On examination, the vagina was found well opened, its parietes soft and perfectly healed, although of a much deeper color than natural. The plug had not been worn for several months, and was only inserted occasionally as a precaution.

This case is one of great interest. Between May 10, 1863, and December 2, 1864, she had been operated on by means of the knife five times, and, with the greatest care, gradually occlusion occurred by contraction after each operation. From December 2, 1864, when the canal was opened by laceration, to the present time (nineteen months), there has been no perceptible change in the size of the vagina.[2] It can scarcely be supposed that the canal would have remained as open had she entirely discontinued the use of the plug, or were she not married; but the point not to be lost sight of is that under the same circumstances after each of the previous operations, the atresia became perfect in a few weeks.

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[1] From the hospital register it is shown that Drs. James P. White, Byford, Storer, T. F. Rochester, E. M. Moore, S. H. Tewksbury, and others, were present at the operation, and I have been unable to find on record that any operator, previous to this date, had washed out the uterus after evacuating retained menstrual blood through a free opening.

[2] August 1, 1867, she reported herself in good health, and able to live with her husband without difficulty.

CASE IV.—Oct. 27, 1864, Miss N., aged 18, came under my charge as a private patient. She was a slight, delicate, and apparently an undeveloped child, of not more than twelve years of age. There had been no attempt at puberty, and I was consulted in consequence of the absence of menstruation at so advanced a period. The external development of the organs of generation was found in keeping with her apparent age. On attempting to make an examination, I discovered that the vagina was absent, and only a slight sulcus between the labia. A sound was passed into the bladder, and the index finger of the left hand into the rectum; on an approximation, the intervening tissue was apparently not thicker than the vesico-vaginal tissue is usually found. After a careful exploration per rectum, I detected a small mass just within reach, which I supposed to be either a cornu of the uterus, or the organ undeveloped.

After questioning her mother carefully, I learned that her daughter had received an injury, when about seven years of age, which proved to have had a bearing on her case. She stated that while running in a wood, her daughter had tripped, over the dead limb of a tree. In falling, she ran a portion of a bough into either the rectum or vagina, and in consequence was ill a long time from "inflammation of the bowels." Again separating the labia, I detected a slight depression, and at the bottom a faint cicatricial line. I determined to operate, thinking it possible (although it is not always the rule) that puberty had been retarded in consequence of the obstruction.

30th. After a free action of the bowels, she was brought under the influence of ether by Dr. G. S. Winston, who assisted me. She was placed on the back, the lower extremities well flexed on the abdomen, and a sound passed into the bladder, to be held by an assistant. With a pair of scissors, I carefully cut through the cicatricial line, and with the index finger the tissue was broken down to the depth of an inch. The advance was now made in the direction of the mass felt through the rectum, by sweeping the finger laterally to the right and left, until firmer tissue was reached. When it was apparent, by the sense of touch, with a sound in the bladder, and two fingers in the rectum as a guide, that in either direction the relative distance was not preserved, pressure was made in the opposite direction, until a median course was regained. The tissue was readily broken down, and with little bleeding; the uterus was reached at the depth of three inches, in some ten minutes. The separation was continued less than an inch beyond the cervix, when the tissue became so dense that it was evident at this point that the peritoneal cavity had been entered at the time of receiving the injury. The neck of the uterus was uninjured, while the vagina had been destroyed up to and around the cervix, without involving it. The sound passed into the uterine cavity an inch and three-quarters.

A large glass plug was introduced, and retained by a bandage. During the night she was so comfortable that an opiate was not required; not a bad symptom occurred, and at the end of a week, the improvement in the condition of her nervous system was remarkable. The vagina was daily syringed with tepid water, and all discharge ceased at the end of three weeks. A month after the operation she returned home, with an injunction to continue the use of the plug and injections for several months, and, if there was no contracting of the canal, gradually to discontinue them.

Three months afterwards she menstruated for the first time, and so rapid had been the development of puberty, that several members of the family, I was informed, who had not seen her since the operation, did not recognize her. After missing a month she became regular, and has continued so in perfect health. I had not heard of the case again until her mother visited me from a neighboring State, on the 25th of April, 1876, and gave me the above history of her case after her return home.

CASE V.—Miss K., aged 21, a private patient, consulted me, July 24th, 1865, having never menstruated. In appearance she was tall, well formed, and apparently in good health. Since the age of sixteen, she had been subject to sick headaches, and occasionally to a wearing pain low down in the back, but with no evidence of periodicity, as indicative of a menstrual nisus. There had been no change in her general health, but during the previous year she had become nervous and irritable in her disposition.

On examining the case, I discovered an entire absence of the vagina, and by the rectum no indication whatever of the uterus. The external organs of generation were well developed, the nymphæ unusually large, and of a dark color. The meatus urinarius was quite patulous, but not so much so as is usually the case where the vagina is congenitally absent.

The young lady, unfortunately, had been engaged to be married for several years, and her parents were exceedingly anxious that an attempt should be made to reach the uterus or to settle the fact of its absence. In consequence of the warm weather, I delayed the operation until autumn.

Oct. 5, 1865. In consultation with Drs. Thos. Cock, T. G. Thomas and Burroughs, she was etherized and placed on the back, with the lower extremities flexed on the abdomen. After snipping the tissue with a pair of scissors, for nearly an inch in a vertical line at the bottom of the sulcus between the labia, the cellular tissue was lacerated by means of the nail and index finger, as in the previous case.

High up in the pelvis, a thick transverse band could be felt from the rectum, as if it were a portion of the broad ligament occupying the position of the uterus, and stretching from one ovary to the other; at this point it sagged within reach of the finger. The advance in this direction was made with great care, in consequence of the extreme thinness of the septum, between the bladder and rectum. The existence of any portion of the uterus was the main point to be settled; therefore the false passage was not enlarged laterally more than enough to admit the finger readily. After extending it to the depth of some three inches, an absence of the uterus became so evident, that in consultation it was decided to discontinue the operation. A glass plug was, however, introduced. The bleeding had been slight. She was confined to bed, and sat up at the end of a week.

The disappointment was very great, and on being questioned whether I could be positive as to the non-existence of the uterus from the fact that it was not found in the median line, I determined to make a thorough effort to settle the point. A few days afterwards, with the assistance of Dr. John G. Perry, ether was administered, and I proceeded with the operation. The false passage was still over two inches deep; this I enlarged laterally with the finger, until I reached firmer tissue, and could feel the sides of the pelvis, as in an ordinary vaginal examination. After an advance of some three inches, I began to realize the danger of continuing the lateral dilatation to the same extent, as it was evident, from the sense of touch, that the uterus was wanting, and that the tissue was not so dense beyond. An advance was continued, however, in the median line for an inch further, until I was satisfied that scarcely three-quarters of an inch intervened between the extremity of the finger in the vagina and the edge of the band felt through the rectum.

Two fingers were passed into the rectum, and, with the aid of a hand over the abdomen, nothing could be ascertained as to the existence of the ovaries. High up on the right side a mass was indistinctly felt, but it seemed too distant for the ovary, and there was nothing to correspond on the opposite side. My impression was, that they were either entirely wanting, or in an undeveloped state.

It was remarkable, for such an operation, that the bleeding should have been so slight, and confined chiefly to the breaking down of the surfaces already well healed. A plug, a little over four inches long by two in diameter, was inserted.

During the night the stomach continued irritable from the effects of the ether, and she was restless, with a pulse of 108. Before daylight, an opiate enema was administered, and repeated in three hours afterwards. She became quiet, and twenty-four hours after the operation she was very comfortable. Beyond the use of vaginal injections and anodynes when needed, she received no further treatment. At the end of ten days she sat up, but her convalescence was so tedious that she was not strong enough to return home until Nov. 24th.

I saw her occasionally in the interval, until June 15th, 1866. I then made a careful examination, both by the rectum and vagina, but there was no further indication of the existence of either uterus or ovaries. The vagina was as capacious as at the time of returning home, after the operation; its parietes were soft and of a natural color, except on the rectal septum about an inch from the fourchette, where I found several indolent-looking excrescences, to which nitrate of silver was applied. The plug, for several months, had not been used with any regularity, and only passed occasionally at night. She was in her usual good health, free from all vaginal discharge, but still nervous and easily excited. During the past eight months there had been nothing in her condition which would indicate any menstrual nisus.

This case, apart from the interest bearing upon the subject under consideration, is an anomalous one. As a well developed-female, with this single exception, without any vicarious discharge, her general health is excellent, while there is no indication, at present, of chlorosis, phthisis, or any organic disease. The condition of her nervous system may be hereditary to a certain extent, for her mother is of the same temperament.

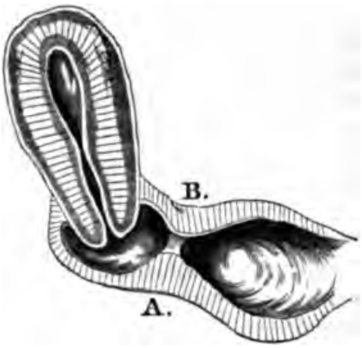
The subsequent history of this case is of interest. During September, 1866, she married, as the vagina had become healed with a surface closely resembling mucous membrane. The dilator had been introduced with efficient regularity to keep open the passage, and I could detect but little if any change. The marriage was contracted with the full understanding of both parties that there was scarcely a possibility that even a rudimentary uterus existed, and that the probabilities were that the canal would gradually close. I heard nothing of her after her marriage until early in May, 1874, when I met her accidentally on a visit to one of her relatives who was under my charge. I had not an opportunity to make an examination, but she stated to me that her married life had been a happy one, and she was not conscious that any material change had taken place in the size of the passage. I could see no change in her appearance except that she had aged somewhat beyond her years and had become less nervous.

Case VI.—Miss L. O. consulted me Oct. 27, 1870, on the recommendation of her physician, Dr. Zakryewska, of Boston. Her age was 17, and she had never menstruated, although for two years previous, there had been every month an increase of backache, nervous disturbance, and feeling of pressure in the pelvis. The uterus was distended, as well as a small portion of the vagina, or rather posterior cul-de-sac, for from the rectum a marked transverse depression could be felt along the junction of the vagina and uterus. Fluctuation was detected in the rectum by making pressure with the other hand on the fundus through the abdominal wall.

Nov. 1. After the patient had been placed under the influence of ether, I opened a passage, about three inches deep, to the uterus, and evacuated between eight and nine ounces of menstrual blood, which presented the usual characteristics, in being free from odor, and in possessing a tar-like consistency. The uterine cavity was washed out thoroughly with warm water, a glass dilator introduced, and the case treated in other respects by the method above described. After menstruating twice without difficulty, she returned home about the middle of February, 1871, with the vagina open and healed. With the exception of a slight febrile action on the third day, there had not been the slightest disturbance during the progress of the case.

April 13, 1873. She reported herself for examination, having been in excellent health and menstruating regularly. On examination, I found an hour-glass-shaped contraction of the vagina at about half an inch in front of the cervix, through which the index finger could be passed with difficulty. The seat of constriction was situated at A B (see Fig. 44), and corresponded with the point at which the opening was made at the time of the operation between the new passage and the upper portion of the vagina, then distended with blood.

Fig. 44.



Occlusion of the vagina.

15*th*. I freely divided this encircling band with a bistoury, and the surface healed over a glass dilator before she returned home. I have not had the opportunity for an examination since, but have recently ascertained that the vagina still remains somewhat constricted at this point, but without entailing any inconvenience upon her.

Case VII.—Miss D. R. was admitted to the Woman's Hospital Dec. 13, 1870. The previous history of this case is obscure, as recorded, from the statement made by the patient that, after the performance of some operation by her physician, she menstruated several times at the age of fifteen and sixteen. A long interval then elapsed without a show, until after a fit of illness and a profuse discharge of pus with hemorrhage, when she had, at regular intervals, several menstrual periods, as they were thought to be. About four years previous to admission an attempt had been made to open a vagina, but apparently without the operator taking the precaution to introduce a sound into the bladder and his finger into the rectum, to serve as guides, since an opening was made into the bladder, from which she afterwards had incontinence. About one-third of the urethra, and the base of the bladder for nearly an inch beyond the neck, had been laid open. The raw surfaces had been constantly coated with a phosphatic deposit from the urine, so that the parts remained as patulous as after the accident, and the finger could be introduced into the bladder without difficulty. By the aid of the index finger in the bladder, and another in the rectum, I was unable to detect a trace of the uterus. There had evidently been, at some time, extensive cellulitis to the left and in the neighborhood of the region which should have been occupied by the uterus. Judging from the thickness of the recto-vesical septum, the case was regarded as one of congenital absence of the vagina, if not also of the uterus. Until March 10, the time was occupied in getting the parts healed, and in a proper condition for an operation, while, in the interval, on five different occasions, with and without ether, a most careful investigation had been made without gaining any additional information. It was deemed advisable to close first the opening into the bladder, before attempting the operation for forming a new vagina. After great difficulty, from its being at the bottom and to one side of a deep cone, the fistula was closed by ten interrupted sutures. Two days afterwards, she had an attack of peritonitis, and on the 16th of March her life was considered in jeopardy. Reaction took place, however, and on the 24th she was well enough to have the sutures removed; but shortly afterwards the surfaces separated, leaving the parts in their former condition. Her convalescence was tedious until May 20, when she was discharged with instructions to return in the following autumn.

Readmitted December 10, 1871, with her general health much improved, and with the statement that, for several months past, she had suffered at regular intervals with symptoms of a menstrual nisus. Her condition was not yet one to warrant any surgical interference, and she continued to remain under observation. March 19, 1872, she had a show of bloody urine, but it had ceased before I could examine her condition. May 3 a recurrence of the bloody urine took place, but no further information could be gained, beyond the fact that the escape of blood was from some point within the bladder.

June 7. While under ether, a thorough exploration was made by Dr. Sims and myself. A small body was then detected, for the first time, but we were unable to determine the question of its identity with the undeveloped uterus. With a scalpel, I made some advance in that direction, when I opened into a small sinus through which the sound was passed to so great a depth that I supposed I had entered one of the ureters just beyond its entrance into the bladder. No further attempt was made, and on June 12 she was sent home.

Feb. 10, 1873. On her return, ether was administered, and by the rectum, the finger without difficulty detected the uterus, now nearly of a normal size. A small sinus was found, as the result of the previous operation, in the vagina. Along this a probe was introduced, and its course enlarged by means of scissors and by lacerating the tissues. A passage was then continued beyond in the direction of the uterus, until the os was reached, into which the probe was passed to the fundus. A glass dilator was used for a few days, when it had to be abandoned, in consequence of the irritation it produced and a threatened attack of cellulitis. The index finger was carefully passed several times a day to the cervix, that the canal might be prevented from contracting, and, with frequent injections of hot water, the parts were kept free from the irritating effects of the urine. When healed she returned home.

April 15. The fistulous opening into the bladder was closed by twelve sutures. So much disturbance resulted, with threatened cellulitis and irritation of the bladder, that she had to be kept constantly under the influence of opium, and the bladder carefully washed out twice a day by means of a double catheter.

May 1. The sutures were removed, and the union was found perfect.

June 10. I learned that a slight escape of urine took place when walking, but, after a careful examination, it was found due to the condition of the urethra, which had been drawn backward by contraction of the cicatricial surface in the vagina. The vaginal canal had shortened very much in consequence of this contraction, but the calibre was yet sufficient to admit the passage of the finger to the uterus, and the result, under the circumstances, was considered an excellent one. She was discharged, to return again.

March 12, 1874. She was readmitted. Her general health had become established, the retention of urine was perfect, and she had menstruated regularly, with the flow lasting four days, and rather free in quantity.

May 26. The vagina was enlarged as much as was deemed prudent, without the risk of setting up a fresh cellulitis, which, it was possible, might have followed if carried too far, since the remains of the previous attack were still to be detected. She was afterwards discharged, to return at some future time, for the purpose of having the vagina thoroughly opened in case she contemplated marriage, or if contraction sufficient to obstruct the escape of menstrual flow should take place.

Three years have now elapsed since her discharge, and I am ignorant of her present condition.

CASE VIII.—Miss A. L., aged fifteen and a half years, was admitted to the Woman's Hospital March 4, 1876. She had never menstruated, but eight months previous to admission she began to suffer for the first time from pain at the hypogastrium, lasting from two to three days. Since the first, the pain had returned regularly every month, with increasing severity and duration. Only a few days previous to admission she had passed through one of these periods of suffering which had lasted ten days. Her general health was poor, and she had a marked strumous appearance. The external organs of generation were well developed, but, on separating the labia, a sulcus was seen terminating in the urethra. By placing the hand over the abdomen, and an index finger in the rectum, an elastic mass was felt like the uterus at the fifth month of gestation. The case was evidently one of retained menstruation due to congenital absence of the vaginal outlet, with the upper portion of the vagina distended, as in Case VI.

March 14. While under ether, the skin was snipped with a pair of scissors, in a vertical line below the urethra. The patient had been previously placed on the back with her lower limbs flexed on the abdomen. A steel sound was then passed into the bladder and held by an assistant on the left of the patient. I introduced two fingers of the left hand into the rectum as a guide, and between them and the sound separated rapidly the cellular tissue, by means of the finger nail, until I had made an opening about an inch in depth. The opening was then freely enlarged, by working the finger to the right and left; after this the advance was made by sweeping my finger from one side of the pelvis to the other. This was readily done, as there had been no cellulitis, and, if I felt that I was getting too near either the bladder or rectum, I would make pressure downward or upward until I got, as it were, into another stratum. After advancing about two inches and a quarter in the median line, the septum between my finger and the fluid had been reduced to a few lines in thickness. Through this I introduced a small trocar, and drew off some twenty-four ounces of fluid. The puncture was then enlarged by introducing a pair of scissors, and the parts were lacerated by opening the blades. The finger was then passed, and a free opening made. The uterus was thoroughly washed out with hot water by passing the long nozzle of a Davidson's syringe up into the cavity. To the last quart or two of the water a little carbolic acid had been added. A large glass dilator was then introduced. The patient did well for twenty-four hours, when the pulse rose to 116, and the temperature to 102°, with headache, this being her only complaint.

16th. It was directed that she should have the injections every three hours, with carbolic acid added, as the discharge had become free, and had some odor. Five grains of quinine were ordered every four hours. She still complained of headache, and felt chilly, but there was no marked rigor. At 2 P. M. her pulse rose to 136, and the temp. to 103.7°. At 8 P. M. the pulse was 140 per minute, while the temperature had lowered to 100.2°.

17th. The discharge had become quite abundant, of a brownish color, and still slightly fetid. Her stomach was disturbed, and she vomited several times during the night. At 8 A. M. the pulse was 120, and temp. 101°; at 3.30 P. M. pulse was 130, and temperature 101.5°.

18th. Her condition was decidedly better, and she began to convalesce.

19th. There was a slight relapse; the temperature at 102.6° during the night, and a return of the headache.

20th. Detected marked tenderness over the lower portion of the abdomen, and especially to the left side, with tympanites. This was discovered after she had had a movement of the bowels from an enema.

23d. I made an examination by the rectum, and found cellulitis on the left side, extending behind the uterus. I directed that a shorter vaginal plug should be used, for I ascertained that, from the second day, the nurse had had difficulty in passing the plug into the upper portion of the vagina. I found the canal constricted at this point, as shown in Fig. 44, Case VI., and I had no doubt that if the cellulitis was not actually produced by her efforts to force the dilator through, its extent was at any rate increased by the irritation.

24th. I directed that the use of the dilator should be abandoned, but the vaginal injections were to be continued several times a day.

25th. During the night she had several loose and fetid movements from the bowels, which were examined by the microscope, and found to consist almost entirely of pus. She was placed on milk-punch, cod-liver oil, quinine, and iron.

28th. The abdominal tenderness and tympanites were found decreasing rapidly, and, by the microscope, but little pus was detected in the feces. She gradually convalesced, but was not strong enough to be discharged until May 10. She had not menstruated since the operation, but this was scarcely to be looked for in her reduced condition.

June 20, 1876. She reported herself at the hospital for examination. Her general health had been improving slowly, but menstruation had not returned.

Feb. 1877. She again visited the hospital, having regained her health, and menstruating regularly. I found the upper portion of the vagina in front of the uterus so constricted that I was scarcely able to pass the index finger. The canal below had changed but little. She will return at some future time, when the canal will be enlarged. It should be noted that, at the time this operation was performed, the atmosphere of the hospital had become so bad from a defect in the sewerage, which was not discovered until afterwards, that no serious operation had been performed for several weeks, and the defect was at that time reported to have been remedied.

CASE IX.—Feb. 13, 1874, I saw Mrs. H., in consultation with Dr. James L. Little. She was a woman of thirty-two years of age, the mother of six children, the youngest being three years old. Seventeen months after the birth of her last child, the cervix had been removed by the galvanic cautery for supposed malignant disease. She suffered afterwards from cellulitis, and, in all probability, from peritonitis, so that she was confined to her bed for five months after the operation, and had never regained her health. If the diagnosis was a correct one, the disease was most thoroughly eradicated, for I found the vagina only about an inch and a half in depth, from the loss of the posterior cul-de-sac and contraction of the canal. A number of folds, radiating in one direction, gave the only indication of the probable locality of the uterus, although, by the touch, nothing could be identified but the pressure of a dense mass of cicatricial tissue, which was exquisitely sensitive. On passing the finger into the rectum, the presence of the uterus could not be recognized, and the tissues of the pelvis seemed solidified. A mass was felt above the pubes, which was supposed to be the uterus enlarged from retained menstrual blood. From long suffering and the presence of this mass of cicatricial tissue in the vagina, her nervous system had been so overtaxed that she had at length reached a condition of mind rendering her almost a fit subject for a lunatic asylum.

It would be out of place to discuss this mode of amputating the cervix, but I will simply state that for some fifteen years I have not resorted to it, in consequence of seeing just such results follow my own handiwork. It was a favorite mode of treatment both with Dr. Sims and myself in the Woman's Hospital previous to that time. I then possessed the advantage, which few have at the present day, of being able to correct my errors by observing the cases long afterwards, since they were then obliged to return for relief to the only institution of the kind in the country. When any portion of the cervix is removed by this method, stenosis is a very frequent occurrence within two years after the operation. When a surface is left to heal by granulation, cicatricial tissue must necessarily be formed, and it cannot be denied that this tissue always contracts, therefore stenosis must be a common result. But, whenever the vaginal tissue is included, we have a yet more serious condition to deal with. As soon as the vaginal tissue heals, it contracts over the stump, as if drawn with a running string, so the uterus becomes at length covered by two thicknesses of the vaginal wall. The occurrence of cellulitis, also, is not an uncommon complication, and is due to inflammation extending into the pelvis from the connective tissue about the cervix, which becomes involved at the time of the operation.

I lost sight of this case until April 8, when she was brought into my office with most violent contractions of the uterus, as if she were in the last stage of labor. The uterus could be felt through the abdominal wall, contracting with such force that I feared rupture would take place and its contents escape into the abdominal cavity. The case was so urgent a one that I was obliged to dismiss my office-patients, and, with only the aid of a nurse, I placed her under the effect of ether, hoping to find some means of getting into the uterus. Failing to detect any point to guide me, I attempted to force a trocar through this dense tissue in the supposed direction of the uterus, but was unable to do so. I then plunged a sharp-pointed bistoury in the same direction, and entered the uterine cavity after passing through nearly an inch of tissue. I was unable to judge at what point I had entered the uterus, but, if through the cervix, the canal must have been closed throughout. Six ounces of fluid escaped, and it continued to flow until the following day. Through fear of exciting inflammation, I did not dare to enlarge the opening or to introduce any substance to keep it from closing. It was impossible to wash out the cavity, and the after-treatment consisted in keeping her quiet in bed and under the influence of opium. After ten days I allowed her to return home.

June 6. I found the opening had entirely closed. I then gave her ether, and, following the same course, made quite a free opening, with no difficulty, except from hemorrhage, which came from the vaginal tissue and needed a tampon for its control.

Oct. 27. She returned, stating that she had menstruated several times, and without pain, but that she had suffered very much latterly, and had had no show at the time for the last period. On the following day, with the assistance of Dr. George T. Harrison and Dr.

Purdy, Jr., she was etherized, and, after making my way into the cavity, I divided the tissues laterally, in four different directions, to the fullest extent, without entering the peritoneal cavity. The wound was packed with cotton which had been saturated in a solution of alum, and over this was placed a pad wet with glycerine.

30th. She had a chill, with a rapid increase of pulse and elevation of temperature. The dressing was all removed, and, for fear of blood-poisoning, I passed a large double catheter into the uterus, and through this injected a large basinful of hot water, to which a little carbolic acid had been added. I then made a drainage tube from a portion of block tin tubing, about an inch and a half in length, dividing it into three portions, the middle one being for the tube, and I cut away from each end all but enough to form two prongs, or flanges, half an inch long, opposite to each other. This was introduced, and the prongs within the cavity were spread apart by passing a pair of scissors through the tube and then separating the blades. The prongs on the vaginal end were turned back, so that the tube became fixed in the wound, like a button in a buttonhole. She began to improve afterwards, and returned home in three weeks. After the next period, I introduced a hollow hard-rubber tube, some two inches long, slightly curved, and in appearance not unlike the instrument used for the trachea, with the exception that there was a long lateral slit or opening on each side. With great difficulty, and by watching her every few days, I was able to keep some contrivance of the kind in the passage for fourteen months. I then abandoned the tube, as it had caused her to menstruate too freely from the irritation produced by its presence in the canal. She was under observation for a month or two longer, and I flattered myself that I had relieved her. During the past winter she has suffered very much and, at length, she ceased to menstruate during a long attack of cellulitis, through which she was attended by Dr. Jos. C. Hutchison, of Brooklyn. She was too ill to visit me for several months, until recently, when I made an examination and found her condition essentially the same as it was at the time of my first examination, over three years before. Her future, in all probability, is to be death from peritonitis or blood-poisoning.

CASE X.—Mrs. St. J., aged 21, was admitted to the Woman's Hospital Oct. 1, 1869. At fourteen she felt pain in the side and back with headache, and these pains returned afterwards with great regularity, as at the menstrual period, but without a show. After a careful examination, I was unable to detect any evidence of the uterus, but as she was a married woman I decided to operate for making a vagina. Oct. 12th, this was done without difficulty, by the method described, and I had already completed the canal to the depth of three inches, when I accidentally ruptured the septum just below the bottom of Douglas's cul-de-sac, and opened into the rectum. As the glass plug could not be used under these circumstances, the operation was abandoned, and the parts were allowed to close. Jan. 27, 1870, I again operated, and at the time of her discharge, Feb. 18, the canal had healed, and was four and a half inches deep. No uterus was found, and the case has only been presented to show that accidental rupture into the rectum is of little consequence beyond the delay it involves.

In forming a vagina, it is essential that the whole operation be completed in one sitting, and that the passage be made much larger than necessary, since it will contract under all circumstances. If the operation be only partially performed, and afterwards completed, contraction will always take place at the dividing line between the two operations, and will be a source of irritation afterwards, and this band must always be overstretched before the other portion of the canal can be dilated. The surface lining the canal is essentially a cicatricial one, and will consequently contract to a greater or less extent, but when healed over glass it approaches nearest in character to a mucous membrane. When tissues are divided by the knife, the contraction is always greater than when lacerated or broken up by means of the scissors. If a passage be opened by the knife alone, the plug will be gradually expelled by adhesion of the surfaces, from above downward, until the original condition is attained. This will always occur, unless some portion of the mucous membrane has remained intact at the upper part of the canal. When merely a section of the vagina has been divided, the required diameter can be preserved as long as a bougie is retained, but after discontinuing its use, the incised tissue will gradually contract until the false passage becomes obliterated, or reduced to a mere sinus. Experience teaches us that a surface which has been lacerated heals with less rapidity than when divided by the knife. Consequently, if the tissues be cicatricial in character, we will thus gain time for the modifying effect, through absorption, which will be excited by the pressure of the dilator.

A common and undesirable result is often obtained in the operation for opening a vagina, as shown in Cases VII. and IX., in each of which a constriction was left. To avoid this, it is necessary that the new canal, opening into the portion dilated, should be as large in diameter, if not larger than any other part, since that which has been overstretched will contract with greater rapidity, thus leaving this constricted portion as a source of irritation afterwards. Whenever the canal has been opened throughout by a single operation, and to a uniform calibre, it can be kept open afterwards for an indefinite period without irritation, by the introduction, daily, of the glass plug, and retaining it for a few moments.

It has been recommended by all writers that the retained menstrual blood shall be evacuated slowly, through fear that it may escape by the Fallopian tubes into the abdominal cavity. I regard this fear as based entirely on theoretical views. Dilatation of these tubes throughout their length must necessarily be rare. If it were so easy for the fluid to escape when this condition exists, it would always be driven out into the abdomen by uterine contractions, for they are frequent long before a necessity is recognized for surgical interference. If it were known that they were dilated and filled with fluid at the time of the operation, it would be to the safety of the woman that a free opening should be made below, as the fluid would naturally flow in the direction offering the least resistance. No attempt should be made to aid the expulsion of the fluid from the uterine cavity by manipulating the organ through the abdominal walls. Should the Fallopian tubes be distended by fluid, such interference would be more likely to rupture them, or to force the blood into the abdominal cavity, than would the uterine contraction.

After the uterine cavity has been emptied, its walls will remain smeared with this tar-like fluid, which cannot be gotten rid of for several days, until it has become partially decomposed and broken down to a watery consistency. With the anæmic condition of the patient, and the irritable state of her whole system, she is the more susceptible to blood-poisoning, and it is remarkable, under the circumstances, that it does not occur much more frequently. With all due care, it is often impossible to protect the woman fully from this danger, or from inflammation, yet the risk must be, beyond question, greatly lessened by thoroughly washing out the uterine cavity.

Dr. C. H. F. Routh reports[1] a case of congenital absence of the vagina, with retained menstruation, on which he operated for opening a vagina, Jan. 7, 1870. The passage was made chiefly by aid of the finger, and the fluid was allowed to escape by a small opening. "Its exit was helped by an injection of a weak, warm watery solution of iodine." A large gum-elastic catheter was left fastened *in situ* with tapes. The same weak solution of iodine, to which carbolic acid was added, was used to wash out the canal as the discharge became profuse. Death resulted on the seventh day. It was found at the post-mortem examination that a teacupful of the fluid had escaped into the abdominal cavity through an aperture in the dilated tube, on the right side, which "was sloughy looking."

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[1] "On a Remarkable Case of Absence of Vagina, etc." Transactions of the Obstetrical Society of London, vol. xii. p. 34.

In the progress of this case, lasting a week, there were symptoms of blood poisoning, but not such as would have been expected had this quantity of fluid remained in the abominal cavity from the time of the operation. Therefore, in the absence of extensive peritonitis, I believe rupture of the tube took place but a short time before death. Inflammation and sloughing of the tube had been going on for several days, in consequence of the distension, and the blood poisoning may have originated from this condition. Rupture and escape of the fluid into the abdominal cavity was evidently but a question of a few days, therefore, a premature occurrence might have taken place when she "was rather frightened by noise in an upper ward, and said she felt as if something had turned completely in her inside." This was at an alarm of fire, and it is reasonable to suppose that rupture did occur at this time, as shortly after, "the whole aspect of the patient was indicative of shock and internal hemorrhage," a condition which continued until her death.

As the fluid did not escape from the fimbriated extremity of the tube, when subjected to compression, it may be assumed that the canal had been dilated from the uterus. In other words, that the mouth of the tube entering the uterus was the most dilated portion when the organ was distended. If this be true, the fluid would have passed out of the tube into the uterus, with a free outlet below for its escape at the time of the operation. The probabilities are all in favor of the supposition that, had there been this free outlet, the fluid would have been drawn out in the direction of the current before it became thus imprisoned by the gradual contraction of the uterus.

Dr. J. M. Richmond, of St. Joseph, Mo., has reported[1] the result of an operation for opening the vagina in a case of complete occlusion, which resulted at eight years of age, from a traumatic injury, similar to the one described in Case IV. He followed the mode of operating recommended by me in the paper to which I have already referred. He was unable to find the uterus at the first operation, as I had fortunately succeeded in doing in my case; but a similar feature in both cases existed in regard to the uterus, in that no attempt at development was made until the vagina had been completed. Dr. Richmond's case was one of a married woman, aged 21, in whom, after a careful examination by the rectum, no evidence of the existence of the uterus could be detected. July 31, 1871, a vagina was opened to the depth of three inches, and, after it had healed, on Sept. 6, the canal was extended to nearly five inches without finding the uterus. The case was treated by injections, as I had recommended, and the parts, as in my operation, were healed over a glass plug. Three months after the last operation there was a slight show, but its source was not detected. In Feb. 1872 the menstrual blood was discovered oozing through a small opening; this was enlarged, and the os uteri found, into which a probe passed to the depth of less than two inches. The uterus afterwards developed, she continued to menstruate regularly, and the vagina remained open. An additional value of the record is the satisfactory report of the case made five years after the operation.

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[1] St. Louis Medical and Surgical Journal, Jan. 1877.

Dr. Routh, in his remarks before the Obstetrical Society on the report of his case, states: "Among the few cases of absence of the vagina recorded, *I do not find any in which the case exactly resembled this, and in which the vagina was made, and the uterus punctured at the same time*, sponge tents having been used after incisions made, and the progress of the operation extended over several days."

This, however, was nearly four years after I had placed on record my method of operating; just six years after the operation had been witnessed by the members of the American Medical Association; and about seven years after my first case.

Amussat, in the report of his case given several years after the operation, throws out the hint that in a similar instance he would favor the completion of the canal at one operation, but he never put the suggestion into practice. All operators subsequent to Amussat followed his teaching in opening the vagina by several distinct operations, and in the gradual evacuation of the retained menstrual fluid by a small opening. Although he broke down the tissues with his finger, fearing to use the knife, it was done chiefly to form a bed for insertion of the sponge, and by a method entirely different from the one described by me.

I may, therefore, claim to have been the first operator on record who completed the opening of the canal at a single operation; to have separated the tissues by freely sweeping the finger from one side of the pelvis to the other; to have given free exit to the retained fluid; and then to have washed out the uterine cavity with warm water, that blood-poisoning might not result.

To complete the canal at one operation is based on sound surgical principles, for thus the danger from inflammation becomes greatly lessened. The entrance from the new passage into the expanded portion about the cervix, should always be made larger than any other part of the vagina, for otherwise, there will remain a constriction at this point. The formation of such bands must be prevented, since the calibre of the canal can never be said to be greater than its most constricted part, and the presence of a band always renders the patient more liable to the occurrence of cellulitis, from the irritation produced by the introduction of the dilator, or plug. Unless a dilator be frequently used, the new canal will always contract to some extent, and unless it be soft, and of a uniform calibre throughout, it will be impossible to keep it open.

I have pointed out the advantages of allowing the menstrual fluid to have a free exit, and there can be no objections advanced to the procedure except on theoretical grounds. Having shown that there is no danger of forcing the fluid through the tubes into the abdominal cavity, the possibility of shock to the patient in consequence of the too rapid escape of the fluid from the uterine cavity may be next considered. From the fresh opening, it would be impossible, on account of the tenacious character of the fluid, to empty the uterus so rapidly as to produce any shock. If such a result were likely to follow the rapid evacuation of fluid from the uterus, it should at least sometimes occur from the sudden escape of the liquor amnii.

The glass plug was introduced by Dr. Sims, to be used after having divided cicatricial bands in the vagina, that, by pressure, absorption might take place, and the parts be softened down, preparatory to closing a vesico- or recto-vaginal fistula. I was the first to employ this instrument in the after-treatment of the operation for forming an artificial vagina.

After a thorough injection of warm water has been given, and a glass plug of a proper size introduced, all the air and fluid in the vagina will have been displaced, or pressed out. The parts are thus shut out from the action of the air, and the instrument is retained in place, by atmospheric pressure, as long as the woman remains quiet. The instrument is cool, clean, and unirritating; it keeps up steady pressure on the parts, and, consequently, prevents undue congestion. But, above all, it possesses two great advantages, but only when made of glass, viz., that of being innocuous and transparent, so that it inflicts no injury, and allows of the surfaces being seen at all times, as through a speculum, without its removal.

I regard the washing out of the uterine cavity as the most important precaution against blood poisoning, and next in importance to this I place the use of this instrument, to which I attribute a success which has been equally great with all who have employed the same method.

To fill a cavity, made through loose cellular tissue, as has been the general practice, with porous substances, as sponge, lint, etc., which must retain and keep the parts bathed in the decomposed discharges, establishes a condition so favorable to blood-poisoning and inflammation that it would be remarkable if any case should escape.

CHAPTER XII.

PELVIC HEMATOCELE.

Definition—History—Applied terms—Source of the blood—Frequency—Symptoms—Varieties—Differential diagnosis—Treatment.

Definition.—An accidental collection of blood in the pelvis, either in the peritoneal cavity, or outside of the peritoneum, within the connective tissue of the pelvis.

A hematocele is a symptom and not a disease, simply a result from one of many different causes, any or all of which may give rise to it.

History.—The greatest difference of opinion has been maintained from the beginning, and almost to the present time, in regard to nearly every essential feature of this condition. The literature on the subject has become voluminous. The contributions from the French writers are the most extensive; in Germany and Great Britain almost as much has been written; while the subject has received comparatively but little attention in this country.

Whatever may have been the knowledge of the older writers on this subject is now of little practical value to us, since they have transmitted their views in terms too vague.

Recamier described, in 1831, a pelvic tumor filled with blood, which he cut into, mistaking it for an abscess. Other writers in Paris shortly after recorded similar cases, but to Nélaton[1] I think must be credited the first accurate description given of the pathology of the lesion. These claims of priority are challenged by Bernutz, and are granted to him by many writers. His first contribution to the subject was given in the *Archives Générales de Médecine*, 1848 and 1849. Afterwards he presented his views in a more extended form,[2] which was translated and edited by Dr. Alfred Meadows, in 1866, for the New Sydenham Society, London. From this work I quote:[3] "To

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[1] Gazette des Hôpitaux, 1851 and 1852.

[2] Clinique Médicale sur les Maladies des Femmes, par MM. Bernutz et Goupil, Paris, 1860.

[3] Vol. i., part 2, p. 159, note.

Ruysch (1691) undoubtedly belongs the honor of having first mentioned the escape of menstrual blood into the peritoneum." "To M. H. Bourdon (1841) belongs the credit of having first described the physical signs of those blood tumors now called hematoceles, which he thought were situated in the peri-uterine cellular tissue, but whose relation to menstrual irregularity he entirely ignored." "M. Velpeau (1843) had the honor of first diagnosing during life one of these blood tumors, without having recourse to an exploratory incision, though he did not recognize its exact situation nor its relation to menstrual disturbance." "I may, perhaps, be allowed to state that: 1st. No one can claim to have preceded me in pointing out the relation which exists between these blood effusions, now called hematoceles, and disturbances of menstruation," etc. "2d. That hardly any addition has been made to the anatomico-pathological description of hematoceles which I first sketched out."

Dr. Tilt, a student of Recamier, was the first English writer to describe the condition, in a paper read before the Medical Society of London,[1] and in the second edition of his work. Dr. West also describes the lesion in his work, which was published about the same time. Professor Simpson recognized the accident in 1854, an account of the case being published in the *Medical Times and Gazette*, 1859, and subsequently in his works. A knowledge of hematocele became more general after the clinical work of Bernutz and Goupil was published. One of the most complete cases on record was presented by Dr. Henry Madge in a paper "On Uterine Hematocele," published in the *Transactions of the London Obstetrical Society*, vol. iii., 1861. Dr. Matthews Duncan, of Edinburgh, contributed a valuable paper on the subject to the *Edinburgh Medical Journal*, 1861. An extended article "On Pelvic Hematocele, with special reference to its Diagnosis and Treatment," by Dr. Alfred Meadows, was published in the *Transactions of the London Obstetrical Society*, vol. xiii., 1871. The works of Tilt, Bennett, West, Simpson, Churchill, McClintock, Hewitt, Barnes, and others, all contain additional material gathered from personal observation.

In Germany, Prof. Braun, of Vienna, in 1861, wrote an extended article on the subject of hematocele, and Virchow, Olshausen, Fritsch, Schrœder, Beigle, Klebs, and others have made valuable contributions.

The most complete treatises in the French language are by Bernutz and Voisin, in 1860; in the German, by Dr. C. Schrœder;[1] and in the English that by Dr. Tuckwell, Oxford, 1864.

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[1] Published in the London Lancet, 1853.

In this country, as I have stated, there seems to be but little literature on the subject beyond the reports of isolated cases scattered through the journals. Prof. G. S. Bedford, of New York, in 1855, recognized the existence of a hematocele in a case presented at his clinic. The tumor was tapped, and a description of the case is given in his work on the diseases of women. Dr. John Byrne, of Brooklyn, in 1862, read a paper on hematocele before the New York Academy of Medicine, which, after being extended, was published by Wm. Wood, New York, 1862. This monograph contains the report of several cases, and was a full digest up to that time, and was, I believe, the first paper printed on the subject in this country. *The American Journ. of Obstet.*, New York, August, 1873, contains "Remarks upon the Diagnosis of Pelvic Hematocele," by Dr. Lee,[2] who reports some cases under his observation, and is valuable for its bearing on the differential diagnosis. In the *Virginia* (Richmond) *Medical Monthly* for October and November, 1875, will be found an extensive article on "Retro-uterine Hematocele—a Gynæcological Study," by Dr. Harrison.[3] Some cases are given, and the literature on the subject is very complete. The paper is written to show the chief source of hemorrhage in cases of hematocele, and will be again referred to.

Applied Terms.—Bernutz prefers the term peri-uterine hematocele, as expressing the fact that the blood may accumulate at any point about the uterus. He was of the opinion "that the bloody tumor which is left as the remains of a hematocele has no right to be regarded as a specific disease, apart from that which caused it," "the hemorrhage itself being regarded merely as a symptomatic expression of these morbid conditions." Nélaton termed the condition retro-uterine hematocele, since he considered this to be the only locality in which it is found. Voisin uses the same term, and, with Bernutz, held that a true hematocele could only consist of an effusion within the peritoneal cavity. Simpson, on the contrary, considered a hematocele to be usually formed by hemorrhage taking place outside of the peritoneal sac; while Bernutz designates such a blood tumor in the cellular tissue as a pelvic hematoma or thrombus. These views are held by Meadows and others, with the additional distinction that, as a rule, the hematoma is connected with the puerperal state or is the result of an injury.

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[1] Kritische Untersuchungen über die Diagnose der Hæmatocele Retro-uterina, u. s. w., Bonn, 1866.

[2] Charles C. Lee, M.D., Assistant Surgeon to the Woman's Hospital of the State of New York.

[3] George T. Harrison, M.D., Assistant Surgeon to the Woman's Hospital of the State of New York.

Source of the Hemorrhage.—Bernutz regarded the source of blood as in the uterus, and that it was simply the retained menstrual flow, which regurgitated through the Fallopian tubes. This view seems to merit scarcely more than a passing remark. It is now well known that the contents of a distended uterus never pass into the peritoneal cavity, unless by rupture of the organ itself or of the uterine portion of the tube which may have become dilated. Trousseau held the same view as to this being a source, but, in addition, that by exhalation the hemorrhage might take place from the mucous membrane of the tube itself. This might possibly occur, under certain circumstances, from that portion near the fimbriated extremity. Nélaton conceived that the origin of the hemorrhage was from a rupture of a Graafian follicle, the blood naturally gravitating from the surface of the ovary to the bottom of Douglas's cul-de-sac, the most dependent point. Dr. Madge, in support of this view, refers to the then well-established belief that the fimbriæ of the Fallopian tubes continued to grasp the ovary during the menstrual period, so that not only the ovules but all the blood and secretions from the ovaries and tubes passed into the uterine cavity at the same time. These views were advanced by Rouget, and supported by Gaillard, who even believed that this was the chief source of the menstrual blood. Dr. Tyler Smith, in the discussion on Dr. Madge's paper, considered the blood of a hematocele "to be essentially a form of ovarian or Fallopian menstruation, vicarious in character." Unless under some unusual condition, the blood lost upon the escape of an ovum must be too small in quantity, and, from the frequency with which the fimbriæ are found bound down by adhesions after death, hematocele would be of far more frequent occurrence if it were true that the blood passed in this manner.

A number of cases have been placed on record where the hematocele has been formed in the peritoneal cavity by the rupture of a distended ovary, from hemorrhage taking place within its own stroma, and this accident has been termed ovarian apoplexy. Bichât, in his Surgical Anatomy, and Devalz, in a treatise on "Utero-ovarian Varicocele" call attention to the extravasation of blood from a rupture of the utero-ovarian vascular plexus forming a hematocele. After repeated pregnancies, or from any cause where the venous circulation has been much obstructed, the vessels become varicose. A change has then been brought about in the coats of these vessels, and being without valves their power of resistance is greatly lessened. Under these circumstances, and with a condition so common, it is a matter of surprise that the accident does not more frequently occur. In fact, a glance at Savage's plates, showing the venous circulation about the uterus, should convince any one that rupture of these vessels must be one of the most frequent causes of extravasation of blood into the cellular tissue, and secondarily into the peritoneal cavity. This rupture may occur—

1st. From the mass of vessels known as the bulb of the ovary, and then it would pass into the peritoneal cavity.

2d. From the pampiniform plexus and network of vessels under the tubes and between the folds of the broad ligament. The blood may then be either extravasated into the cellular tissue, or, by rupture through the sides of the ligament, pass into the peritoneal cavity.

3d. From about the vaginal junction, at the bottom of Douglas's cul-de-sac, or at some point in front of the uterus, but outside of the peritoneal sac, so that the infiltration would pass into the connective tissue of the pelvis.

Rupture of one of these vessels may readily occur about the time of the menstrual flow, during childbirth, or from a miscarriage. Hematocele frequently results from excessive sexual intercourse, from some prolonged exertion, from direct violence, and even, it is claimed, from sudden mental shock. I have known the accident to occur, but as an exception to the rule, without any reference to the time of either menstruation or pregnancy. Rupture of the Fallopian tube, from tubal pregnancy, or of the sac in extra-uterine abdominal pregnancy, as well as of the uterus itself during the progress of labor, almost always causes serious hemorrhage into the peritoneal cavity. Some observers have attributed hemorrhage into the peritoneal sac to the cachectic condition accompanying anæmia, chlorosis, purpura hemorrhagica, and some of the eruptive fevers.

Virchow has pointed out a common source of hemorrhage from the new capillary vessels found in the false membrane, or other products of a local peritonitis. This takes place just as a clot is formed on the dura mater between different layers of exudation or false membrane. Accumulations in the peritoneal cavity gravitate into Douglas's cul-de-sac, and become there encysted, if inflammation should be excited; or the blood may remain free, forming only a pool in the most dependent portion, according to the rapidity with which it has escaped.

Hematocele occurs, as a rule, about midway in the menstrual life, at a time when the organs of generation are most active. Yet cases have been reported where the accident has taken place several years after the normal cessation of menstruation.

Hematocele is most common among those women who have borne a number of children in quick succession, yet it is not an uncommon accident with the sterile, while it is a rare occurrence among the unmarried unless as a result of violence.

We find on no other point does there exist a greater difference of opinion than as to the frequency of this accident. I think the varied experience has been due to different classes of patients, and the different circumstances under which they were treated, *i. e.* whether at home or in hospital. It is a comparatively rare affection among the wealthy and better classes, except in connection with the puerperal state. In all forms the lesion is most common among the poor and overworked. Again, physicians visiting at the patients' homes will see a much larger proportion of cases than those whose practice is confined chiefly to the office or to the wards of a hospital. In twenty-five years there have been but four cases of hematocele treated in the Woman's Hospital, and in sixteen years I have had but three in my private hospital. On the other hand, during the same time I have been called by physicians in general practice to see a number of cases in consultation, or to determine the character of the lesion. The explanation is evident, the onset of the disease is generally too sudden and violent in character to admit of removal to a hospital. Some writers have considered that women residing in one locality were more liable to this accident than those living in some other district.

If we limit the acceptation of the term Hematocele to an accumulation of blood confined to the peritoneal cavity, the accident is comparatively a rare one. But if it be held to embrace all blood accumulations in the pelvis, the occurrence is certainly a far more common one than the profession at large have any conception of. The occurrence of cellulitis, which is often supposed to be the primary difficulty, is frequently excited, I am satisfied, by some unappreciated and insignificant loss of blood from the rupture of a small bloodvessel. Rupture into the connective tissue must be a frequent occurrence, and while this may account for many of the sudden attacks of cellulitis, it as often takes place without producing any noted disturbance. We are obliged to acknowledge our ignorance of the law determining the certain degree of immunity which does exist. Under ordinary circumstances, the extravasation of a small quantity of blood should produce but little or no irritation, and I have detected, by accident, in one instance, quite an accumulation of blood going on in the peritoneal cavity without the patient suffering any discomfort. Yet frequently the shock to the nervous system will be profoundly expressed from the first escape of blood, and without bearing any relation to the quantity, unless it be excessive. Again, the blood may escape into either the peritoneal sac or into the cellular tissue, when, after a certain amount of shock, reaction may take place promptly, and the mass be rapidly absorbed without having excited any inflammation. Yet symptoms of cellulitis or peritonitis will be as often manifested from the slightest escape of blood, and without there being any close relation to the extent of effusion.

Symptoms.—An attack of hematocele may be preceded by pains about the pelvis, and a feeling of discomfort from an increased quantity of blood flowing to the parts, but the bearing of these symptoms would be likely overlooked or attributed to other causes. Menstruation, if existing at the time, may suddenly cease, or may have been unduly prolonged before the attack without any apparent reason. But a sudden attack, without any premonitory symptom, is the rule, and, while the symptoms are often less urgent than would seem justified by the extent of hemorrhage, the degree of suffering will be a better indication of the prognosis. A sudden and excruciating pain over the abdomen, but more intense about the region of the pelvis, may be given as the first symptom of hematocele. The pain will be accompanied by nausea or vomiting of bile, and with all the symptoms of collapse from shock to the nervous system, or from loss of blood. The extremities may be cold, the skin bathed with sweat, the features pinched in appearance, and the pulse rapid and weak, or imperceptible at the wrist. There can be no mistaking the gravity of the attack if a serious one, for it will be as marked as the collapse of cholera. The pain is beyond every other symptom the most characteristic, and is as excruciating as if the tissues were being torn apart with violence. In addition, there may be great irritability of the bladder, and tenesmus, excited by pressure of the mass.

These symptoms may gradually subside in intensity, and convalescence set in, or an aggravation may take place in a short time from fresh hemorrhage attended with a more profound degree of collapse than before, or even death may soon result. In other instances the first effusion of blood may have been slight, or may not even have been recognized until an attack of cellulitis comes on. This latter condition may then become complicated by additional hemorrhage, forming a hematocele within the closed space formed by the recent attack of inflammation. In such a case, with the fluid confined, the suffering is far more acute than it would be were the blood free within the cavity.

When the finger is introduced into the vagina, a smooth, round, and boggy mass, with or without fluctuation, is generally felt in the posterior cul-de-sac, which, in proportion to its size, will lift the uterus upward and forward towards the pubes. A distinct mass is, however, rarely felt, and a displacement does not occur except when the fluid is confined to a limited space, or when extravasated into the cellular tissue beneath Douglas's cul-de-sac. When the blood is poured out rapidly into the peritoneal cavity, it will naturally gravitate into Douglas's pouch. But under other circumstances a clot may form about the seat of rupture, so that nothing can be detected in the cul-de-sac for an indefinite time after the occurrence of the accident. If peritonitis has not occurred, and the blood is thrown out rapidly, it will accumulate, as any liquid would do, and fill up all the space about the uterus, without displacing the organ. But cases are frequently met with where it would be exceedingly difficult to determine the exact locality of the hematocele, as to its being within or without the peritoneal cavity. But with extreme cases the diagnosis may be readily formed. Thus an accumulation in the cellular tissue of the pelvis cannot lift the peritoneum to any great extent without rupture. But after the blood escapes into the peritoneal cavity, it will be impossible to distinguish the condition from an original accumulation. When a hematocele is formed within the peritoneal cavity it may slowly enlarge, and extend out of the pelvis on the side of rupture, to above the line of the umbilicus, although it may have had its beginning in a rupture in the cellular tissue. But, on the other hand, if the mass is felt extending low in the pelvis, the probability is far greater that the effusion is confined to the cellular tissue. If simply poured out into the peritoneal cavity, the blood cannot escape; while if it were circumscribed by inflammation, such a barrier would be ruptured easier than the blood could be extravasated from the cavity into the connective tissue.

As the case advances the tenderness on pressure will become marked throughout the vagina as well as in the abdomen which is usually tympanitic. The patient may be exceedingly restless, but so long as she can remain in any one position it will be with the lower limbs flexed on the abdomen. When the accumulation becomes sufficiently large, the rectum may be so compressed as to render it almost impossible to evacuate the bowels, and the introduction of the catheter may be necessary to relieve the badder.

The most extensive accumulation of blood may suddenly find an exit by rupture into the rectum, with recovery, or, if encysted, the rupture may be into the peritoneal cavity, with almost immediate death from shock. If neither rupture occurs nor absorption of the blood takes place, rigors come on and are followed by an elevation in the temperature, to result in a pelvic abscess, blood-poisoning, or death from exhaustion.

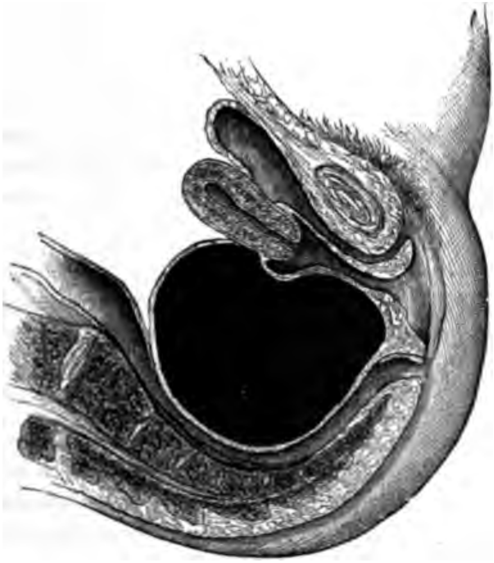
By studying the history of several type cases of hematocele, the reader will be better able to appreciate not only the location of the hemorrhage, but also the symptoms which usually accompany the different forms of the lesion.

CASE XI.—Mrs. W., aged thirty-two years, of Stamford, Conn., came under my care in Oct. 1864. She had given birth to five children in rapid succession, and had been a confirmed invalid since the birth of her last child, which was nearly two years previous to consulting me. The uterus was found very much enlarged and anteverted, while at the same time it sagged quite low in the pelvis. The perineum had been lacerated, and the vagina was relaxed, and there was a partial cystocele. A number of hemorrhoids were discovered, but the condition of the rectum was considered the most urgent feature in her case. She had been unable to stand beyond a few moments at a time since the birth of her last child without exciting nausea and tenesmus, and a feeling of great fulness about the pelvis, but while in bed she was comfortable. So far as I had any means of judging, her complaints were out of all proportion to the local disease, and I charged her with having contracted the habits of an invalid. This statement mortified her exceedingly, and she expressed a determination to carry out every direction. Without giving her time for reflection I called two nurses to get some clothing on her, and directed them to support her on each side, as she was being walked back and forth in her room. In a few seconds she complained of a feeling in the pelvis as if she would burst, and of being nauseated. I persisted, however, that she should continue the walk, as the only means by which she could regain the use of her lower limbs, but she soon became deadly pale, vomited, and fainted. She was then put to bed, and I was more puzzled than before as to her condition.

After some preparatory treatment, I operated for the removal of the hemorrhoids, with a good result, and then began to make applications of iodine within the uterus, with the hope of reducing its size.

On one occasion, when within a few days of the time for her menstrual period, I had more difficulty than usual in drawing, with a tenaculum, the cervix forward enough to admit of the introduction of the application within the uterine canal, and in doing so I gave her great pain. It had been my custom to leave this case until the last as she required so much time and aid from the nurse, and on this day I left the house without indicating my route. At the end of an hour I returned by the merest accident, and found her almost in a collapse, suffering from excruciating agony, and bearing down as if in the last stages of labor. She had complained of great pain from the moment of my examination, but until she began to vomit, the nurse had not appreciated her condition. Then becoming alarmed at her appearance and suffering, she had given a large injection of McMunn's elixir of opium into the rectum. She had also given some stimulant by the mouth, which was at once rejected; a mustard plaster had been placed over the stomach, and heat had been applied to the extremities. When I first saw this woman's face, her features wore an expression of such extreme suffering that the impression can never be removed from my mind. She was bloodless, and her features pinched in appearance, and her eyes bloodshot and apparently starting from their sockets. She would at one moment utter the most piercing single shriek, and then bear down as if she would drive the contents of her body from her. The muscles of her face twitched, and her fingers were finely clenched. Her skin was covered with a clammy sweat, and as she tossed her body to and fro she would vomit, and stain with bile her night dress and the bedclothing about her. I attempted to make a vaginal examination, and felt a mass like a child's head pressing on the perineum, and crowding the uterus above and behind the pubes, so that I could only touch the os uteri with difficulty. I was unable to pass my finger into the rectum to a greater depth than an inch and a half, since the gut was firmly compressed into the hollow of the sacrum.

Fig. 45.



Retro-uterine hematocele.

While a finger of one hand was in the rectum, and the other on the abdomen, I could map out a hard mass filling up every portion of the pelvis, and extending into the abdominal cavity at some distance behind the displaced uterus (See Fig. 45). I had never seen an hematocele of such magnitude, and as I could not detect any fluctuation I would have been unable to form a diagnosis if I had not made a careful examination a short while before. As the mass was below the uterus, and between the vagina and rectum, it was evident that a large bloodvessel had been ruptured. The blood had then dissected up the recto-vaginal septum, crowding the uterus and bladder forward above the symphysis, and lifting at the same time the bottom of Douglas's cul-de-sac until rupture into the peritoneal cavity had become imminent.

Failing in an attempt to reach the bladder with a catheter, I made up my mind that the only course to follow was to relieve the pressure at once, as the patient was now beginning to sink from exhaustion. I plunged a long narrow curved bistoury into the centre of the posterior wall of the vagina as it protruded from the separated labia, but only a few drops of blood escaped. After introducing a probe some distance without resistance, and being evidently within a cavity, I passed in its place, a curved canula and trocar for some four inches. On withdrawing the trocar over thirteen ounces of bloody serum was drawn off, with great relief to the patient. It was then easy to empty the bladder, and upon doing so the patient became comfortable. As the pressure was relieved the vomiting ceased, and reaction soon came on, aided by a small quantity of stimulants, followed by an opium enema. After passing my finger into the vagina, I found the uterus nearly in a natural position in regard to the sides of the pelvis, but much higher than normal. The fluid blood above had evidently been drawn off, reducing the bulk about one third, but still leaving a large mass, or clot, below the uterus, and between the separated walls of the vagina and rectum. On the next day there was some febrile reaction, with tympanites and a moderate degree of tenderness over the abdomen. But by the use of a large flaxseed poultice, and after a dose of oil had acted, these symptoms passed off. She was of a constipated habit, and unfortunately there had been no action of the bowels for several days before the occurrence of the accident. I appreciated fully the risk of causing fresh hemorrhage from administering a purgative, but under the circumstances it was a choice of what seemed to be the lesser evil. On the third day fluctuation could be detected in the lower portion of the mass, while there seemed also to be some increase in its size. While now waiting in expectation, and watching the progress of the case, the patient was kept perfectly quiet in bed, and not allowed even to sit up. The only treatment consisted in the employment of every means to sustain her strength. On the fifth day she had a slight chill with fever, and sweating afterwards, and a restless night. The following day I made a careful examination, and found that while the mass did not extend so high in the abdomen as after the tapping, yet it had gradually increased in size below, so as to fill the pelvis almost as much as before. The patient, however, did not suffer pain as when the hematocele was forming, but the bowels could not be acted on, and she was unable to empty the bladder without the aid of the catheter. As there was fluctuation and every symptom of an abscess forming, I again determined to puncture with a bistoury near the previous opening. On doing so a quantity of offensive pus, bloody serum, and broken-down clots escaped. The opening was then enlarged enough for the introduction of the finger, when a large mass of broken-up clots slowly passed away. As there was no fresh bleeding, the patient was placed on a bed-pan, and while the edges of the wound were kept well apart by the limbs of a pair of spring forceps, the cavity was washed out. I used warm water, to a basin of which I added a sufficient quantity of Churchill's tincture of iodine to give it a decided color. The iodine I employed as a disinfectant, which then took the place of carbolic acid as used to-day. The water was thrown in by means of a glass syringe with a long curved nozzle. I very carefully injected the water so as to wash off the sides of the cavity, from which the fluid had a ready escape into the bed-pan. I had a tampon ready, and every preparation made to arrest bleeding, if it should occur, by plugging the vagina from about the uterus downwards. But as I was careful to use no force, and as the position of the uterus was not disturbed, I did not anticipate any bleeding at so late a date, unless from the walls of the cavity. This I felt certain I could have controlled by keeping the sides in contact by means of the tampon in the vagina. As a precaution, however, I kept a small portion of cotton packed around the cervix for twenty-four hours afterwards, with a drainage tent of lampwick in the opening below. On the following day I again washed out the cavity in the same manner; by the third day the discharge had greatly diminished, it lessened day by day and had nearly ceased at the end of a week. This woman made a very tedious convalescence from the great loss of blood which she had sustained, but at the end of three months she was walking about, and with comfort. As the cavity contracted it brought the uterus into position, and it no longer prolapsed, but was held by adhesions at some point in the pelvis where the circulation was no longer obstructed.

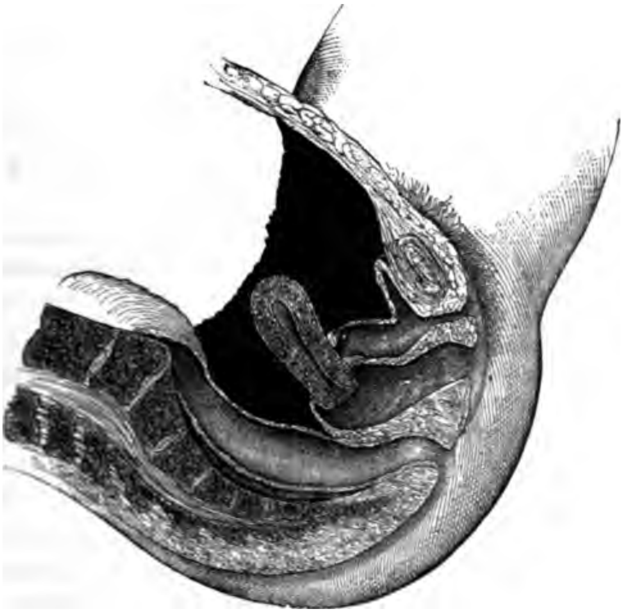
The veins in the pelvis of this woman must have been in a varicose condition, and doubtless became enormously distended as soon as she stood on her feet, so that she then suffered from nausea as if from a sudden loss of blood. This supposition is corroborated by the existence of the hemorrhoids, and the enlargement of some veins about the labia, as in pregnancy.

Evidently a large vein was ruptured in the neighborhood of the cervix when the attempt was made to draw the neck of the uterus forward for the introduction of the applicator. By pressure of the clot, and from contraction of the sac afterwards, a large number of these vessels must have become obliterated. Thus by an accident a result was accomplished which probably could not have been obtained by the best directed measures, or until nature should have completed the process attending a change of life.

CASE XII.—Mrs. L., aged 32, was admitted from the city, Jan. 7, 1875. She had menstruated for the first time at 12, free from pain, the flow lasting five days; she became regular after six months. She had married at sixteen, bore her only child at the age of twenty by a natural labor, did not again become pregnant until three years before admission, when she miscarried at three months and a half, and had not been well since. She at that time lived in New Mexico, and being unable to procure the servants needed in her household, she got up too soon, and was seized with an attack of cellulitis, which kept her in bed for eight months. Since that time menstruation had been irregular, painful, and scanty. She was unable to either walk or stand without pain; her general health was very poor, and she had become exceedingly nervous. She had recently consulted a physician, in consequence of an irregular show, who made a diagnosis of cancer, and sent her to me. When I examined her for the first time, I felt what seemed to be an epithelioma on the cervix; the uterus was enlarged, and tilted somewhat to the left side, from the shortening of the left broad ligament after a cellulitis. I could give with the finger a certain degree of rotatory movement to the growth on the cervix, in which the uterus itself did not participate. She was placed on the side, and on the introduction of the speculum I discovered that a large mucous polypus had been forced out of the uterus, but with a pedicle so short that the mass was crowded over the cervix, covering it almost as a percussion cap would the nipple of a fowling-piece. The traction of the pedicle was sufficient to obstruct the circulation, so that the color closely resembled that of epithelioma, and its surface had become irregular and granular. In fact, it required a good light to determine its true character. Jan. 11, I removed the mass in the presence of, and after a careful examination had been made of the case by, my assistants, Drs. George T. Harrison and Bache Emmet. I tightened a slip-knot of coarse twine, which found its way around the pedicle, and during traction an edge of the mass was lifted, so as to bring into view the pedicle, which was divided with a pair of scissors. To add to the deception, an opening existed where the os should have been, and the probe could be passed for some distance in the direction of the pedicle. When it was removed, there remained on the under side a deep depression, as would be found in a half-grown mushroom.

Her recovery after so simple an operation was tedious, and she complained frequently of pain in the left side, but only where she had often had it previous to the operation. On examination a slight thickening and some tenderness were detected along the left broad ligament. Hot water vaginal injections were ordered, and the frequent application of iodine over the lower portion of the abdomen. Ten days after the operation, Jan. 21, the period returned out of time, and was very free; she was kept in bed, but with no other treatment beyond that directed to improve her general condition. Feb. 12, the menstrual flow returned, and, as it was very free, she was still kept in bed. Two days later a large clot was expelled by uterine contractions, and shortly afterwards another, with the same character of pain. She was then seized with a severe pain over the left side, and this was followed by a chill. On making an examination it was found that the thickening had increased in the broad ligament to nearly the size of a hen's egg. A poultice was applied over the abdomen, and opium administered by the rectum. For some hours afterward she had profuse sweating, which was attributed to the effect of the opium. The flow now became too free, and gallic acid with cinnamon water was given every two hours, but there had remained no pain after applying the poultice on the 14th instant. Feb. 18, she called my attention to an enlargement in her abdomen. After making a vaginal examination I found a large mass on the left side, extending a little above the crest of the ilium and backward, filling up the posterior cul-de-sac. The uterus was in the midst of the mass, and but little displaced beyond a partial prolapse (see Fig. 46). There was no tenesmus or irritation of the bladder, the temperature was 101° in the vagina, and the patient was even unwilling to remain in bed. A certain amount of cellulitis, which had existed before, was rekindled after the operation, and rupture took place through the folds of the broad ligament into the peritoneal cavity, but the blood was thrown out so slowly that no marked symptoms were excited. This was sup-

Fig. 46.



Hematocele in the peritoneum.

posed to have been the course, yet the hemorrhage may have escaped from the surface of the ovary. The flow stopped Feb. 19, and again returned March 14, but with less pain than usual, and lasted only four days. She was then placed on large doses of the iodide of potassium, and after this had been taken for some twelve days, it was noticed that from some cause the clot was being rapidly absorbed. Soon she was able to get out, and on March 27, an excitement, consequent upon having had her pocket picked, brought on the flow, which lasted until April 7. Thirteen days later, in consequence of over-exertion, she again had a flow, which lasted six days. May 2, ordered a blister, as the uterus was still enlarged and immovable, but the mass in the cul-de-sac had disappeared, and the one through the abdominal wall on the left side had been greatly reduced in size. On March 4, it was found that an increase in the size of the mass had taken place; she had felt listless for several days previous. She gradually, however, improved, and on her return home, about the middle of June, the mass had so far disappeared that it would have been overlooked by any one not familiar with her history.

This case illustrates in a marked manner the differences in the degree of disturbance met with in such cases. The effusion of blood was as great as, if not even greater in quantity than, with the first case, and yet the accumulation took place so gradually and imperceptibly, as to attract no attention.

The following case occurred in the Woman's Hospital while I was Surgeon-in-Chief, and in the service of Dr. Harrison. I quote the case as cited by him in his paper[1] already referred to.

CASE XIII.—"*Feb.* 15, 1871. Mrs. A. F. was admitted to the Woman's Hospital with the following history: Menstruation appeared first at the age of eighteen, and until within the past two years showed no abnormal features. She was married at the age of twenty; her husband died not long after marriage. At the age of twenty-seven, married the second time. Has never been pregnant. About two years ago began to suffer with dysmenorrhœa. Leucorrhœa has also been a symptom of late. Three months ago, was seized with a severe pain in the hypogastric region, which confined her to bed two weeks. The pain was so intense that it could only be alleviated by large doses of opium internally, and the application of hot poultices to the abdomen. The period recurs regularly, but is scanty, and the dysmenorrhœa now gives rise to more suffering; bowels constipated; appetite poor.

"*23d.* Examined by Dr. Emmet, who diagnosticated a chronic perimetric inflammation.

"*March* 2. Patient left the hospital on account of domestic reasons.

"*January* 13, 1873. Readmitted into the hospital. She came now under my immediate care and observation, as the Assistant Surgeon on duty at the time; Dr. Emmet seeing her from time to time, according to the routine of the hospital, and giving me the benefit of his counsel and experience. The period is now more protracted and copious than formerly, and is attended with similar pains. Dr. Emmet's examination showed the existence of retroversion of the uterus with pseudo-membranous attachments to the rectum, the result of partial peritonitis. As part of the treatment, a pessary was introduced into the vagina, with the hope that by its lever-like action the pseudo-ligaments would be gradually stretched, and undergo atrophy, and the uterus ultimately be restored to its normal position. It was proven, however, that there existed so much tenderness in the posterior fornix vaginæ, that no pessary that could be placed *in situ* could be worn for any length of time, though the shape was modified repeatedly to meet the exigencies of the case.

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[1] Retro-uterine Hematocele, etc., by George T. Harrison, A.M., M.D., Assistant Surgeon to the Woman's Hospital of the State of New York; Virginia Medical Monthly, Oct. and Nov. 1875.

"31*st*. The last time the pessary was adjusted the patient suffered, for a few hours afterwards, a good deal of pain, and, according to instructions, she removed it. The tissues posterior to the uterus were so sensitive on pressure that the patient was ordered to keep her bed for several days, and to use repeated injections of hot water.

"*Feb*. 5. As the patient walked into the operating room, I was struck with her exceedingly pallid countenance and entire change of appearance since my last visit. She says that she has been feeling worse for the past few days, has now a bearing-down sensation in the pelvis, difficulty of defecation and urination; feels very weak and faint, though she has walked but a few steps, assisted by the nurse, her bed being in the adjacent ward but a short distance away. Examination per vaginam revealed the existence of a large globular elastic tumor, which has dislocated the uterus forwards against the symphysis pubis, and was just behind the portio vaginalis, pressing the posterior fornix vaginæ downwards, and, as investigation per rectum showed, encroaching largely on the sacral cavity. Bimanual palpation demonstrated clearly that the tumor was distinct from the uterus and immediately posterior to it. There was no elevation of temperature or other evidence of fever. There had been no discharge of blood through the vagina, and it was not the time for the recurrence of the menstrual period. It should be remarked that the colon was found a day or two afterwards loaded with fecal matter, which was dislodged with difficulty by copious injections, and it is possible that this accumulation may have had some bearing upon the etiology of the trouble. The rapid manner in which the extravasated blood was absorbed in this case was very remarkable, and tended to confirm the truth of Voisin's statement that 'the tumor from the moment of its development shows the endeavor to diminish.' "

The history of this case is of interest, since the occurrence of the hematocele had no connection with the menstrual flow. After detailing the history of another case, Dr. Harrison summarizes in the following manner: " The fair and legitimate inference to be drawn from the clinical history of these two cases is, we think, that here was a primary closure of Douglas's cul-de-sac, and secondarily an effusion of blood into the closed space there formed; and that the partial pelvic peritonitis, recognized in each case prior to the development of the hematocele, not only furnished the pseudo-membranes roofing the Douglas's space, but also gave origin to the hemorrhage in the way described by Dolbeau, Virchow, and Ferber."

Case XIV.—Mrs. Van B., of Newark, aged 27, consulted me December 6, 1871. She menstruated for the first time at fifteen, after which she had been regular, and was in good health when married at eighteen years of age. One year afterwards she gave birth to her only child by a natural labor. Subsequently the period gradually became more painful throughout the first day, and increased in duration from five to eight days. For a long time she had had a profuse vaginal discharge for several days after the period had ceased. She had been able to walk and stand without difficulty, unless she had over-exerted herself, when there would come on a pain low down in the back. She had been married a second time five years, and sought advice for the increasing dysmenorrhœa and sterility.

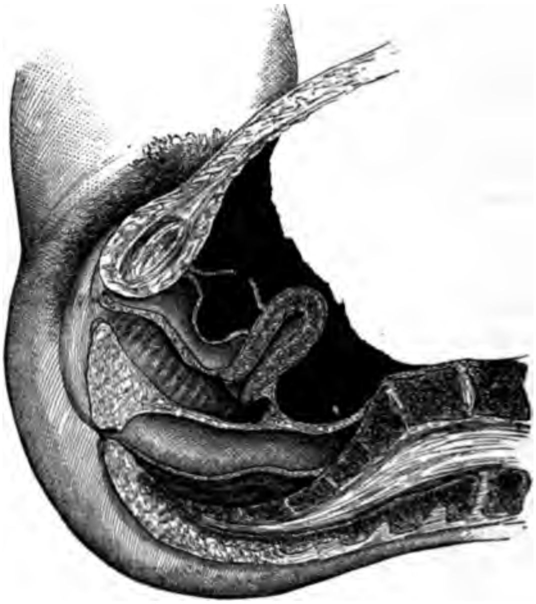
The uterus was found retroverted, with the cervix near the neck of the bladder, and the vagina extending beyond into a deep cul-de-sac. A small mass, not larger than half an inch in diameter, was detected in front of the right broad ligament, just above the vaginal junction; in other words, it was in the angular space formed by the ligament, uterus, bladder, and vagina. This was supposed to be a fibroid, and that from its situation it would aid in causing retroversion of the uterus whenever the bladder became distended. The position of the uterus, and the deep vagina beyond, was thought to have been a sufficient cause for the sterility. The organ was replaced without difficulty, and a pessary was fitted to retain it in position. Within a week she became pregnant, when, without any known cause, she miscarried March 1, 1872, at nearly the completion of the third month.

23*d*. Without consulting her physician she made the journey, on an inclement day, to consult me in regard to a constant show which had continued since her miscarriage, for over three weeks. She was flowing very freely when I saw her in my office, which, together with the weather and her appearance as that of a very sick woman, made me think it best to retain her. She was placed on the elevator, taken up-stairs, and put to bed in my private hospital. For several days I tamponed the vagina, but it caused a great deal of irritation in the neighborhood of the supposed fibroid. This mass could not now be felt, but in its place there was a diffused thickening, apparently more in the vagina than in the cellular tissue beyond. The uterine cavity was carefully explored, by means of my curette forceps, to determine as to the retention of some portion of the placenta, but there was nothing within the canal. She was kept in bed, and iodine was applied for several days with partial success. Large vaginal injections of hot water were administered night and morning, and they were apparently more efficacious in checking the flow than any other means employed. But the patient was both unreasonable and ungovernable, so that she would not submit to taking them through fear that the use of hot water might weaken her. On Monday, April 8, I found her so irritable and fault-finding, from the continuation of the show, that I asked Dr. T. G. Thomas to see her in consultation. He recommended the application of tannin to the uterine canal, made up with cocoa-butter into a proper shape. One of these cylinders I introduced at noon on the following day without difficulty, as she lay on the left side with the os uteri exposed from the use of the speculum. The table was then moved up alongside of her bed, so that she might roll carefully upon it, but instead of doing so she stood up and flounced herself down on the bed in so violent a manner that I remarked she ought to be ashamed of herself. There was no show after the use of the tannin, but, instead of being encouraged, the nurse informed me that she was more depressed than usual. At 8 P. M. she began to suffer from pain over the abdomen, and I directed a drachm of McMunn's elixir to be thrown into the rectum. But she began to vomit before it had any effect, but after receiving a hypodermic injection of morphine, and a poultice over the abdomen, she spent a quiet night. The temperature was 98.5°; the pulse 106, and weak. On the following morning, the pain and vomiting returned. I made a vaginal examination, detecting nothing unusual, that is, I found nothing in the posterior cul-de-sac, but I neglected to place my hand over the abdomen, as it was covered with a poultice. She was kept comparatively quiet during the day by injecting several times a drachm of chloroform, holding in solution an equal quantity of camphor, into the rectum. But it was most evident that she was sinking, and yet suffered but little if any pain. At 5 P. M. she began to show symptoms of collapse, with vomiting and more pain. Dr. Thomas saw her with me at 8 P. M., and on examining the abdomen the presence of a mass on the right side of the bladder was at once evident. He then suggested the existence of a hematocele, which had not occurred to me, from its being in so unusual a place. I had recognized the symptoms as characteristic of hematocele, but found nothing in the posterior cul-de-sac or broad ligaments; and I neglected to examine the abdomen. How many hours this accumulation had been sufficiently great to be prominent through the abdominal walls cannot be answered; it may have had its beginning at five o'clock. The pain gradually increased in severity, so that no amount of morphine, either by rectum and under the skin, seemed to be of any benefit. About midnight she suddenly gave a most piercing scream, and, starting out of bed, wild with suffering, she exclaimed that her insides were being torn to pieces. In ten minutes the stamp of death was on her features, and yet, for six hours before she died, she seemed unable to remain quiet a single second, and, at last, she dropped dead from exhaustion.

On opening the abdomen the lower portion of the peritoneal cavity was found filled with a large clot which covered the pelvic organs.

Removing this clot carefully, it was found that the hemorrhage had commenced in the cellular tissue in front of the right broad ligament. It had lifted the peritoneum throughout from the anterior face of the broad ligament, partially from the side of the bladder, and entirely between the uterus and bladder. After this anterior fossa had become filled with blood, and had lifted the peritoneum, as has been described, rupture took place to the right of, and in a line with, the centre of the broad ligament. The blood then escaped into the peritoneal cavity and occupied about the relative space shown in Fig. 47.

Fig. 47.



Hematocele ruptured into the peritoneum.

The friends were so unwilling to permit an examination that a partial consent was only obtained at the last moment, by a threat of placing the case in the hands of the coroner. Unfortunately therefore we had neither the time nor the opportunity for removing the specimen or of even finding the ruptured vessel.

This form of thrombus or hematocele, when anterior to the uterus, is exceedingly rare, and I believe unique, in this locality, as I cannot find a similar case on record.

Differential Diagnosis.—Hematocele can scarcely be mistaken for any other condition except, under certain circumstances, that of extra-uterine pregnancy or cellulitis. It is scarcely necessary to refer to retroversion of the uterus, when enlarged from pregnancy or congestion, or to the presence of ascitic fluid, ovarian cyst, or a fibroid in Douglas's cul-de-sac. Neither of these conditions presents in common with hematocele such symptoms as could lead to any confusion if an ordinary amount of care is exercised in the examination.

A positive diagnosis, however, cannot always be made, by a single examination, for the existence of pregnancy is possible within the peritoneal cavity at the bottom of Douglas's cul-de-sac. And, moreover, if a rupture should have taken place, or if cellulitis should have been excited, the difficulties of a diagnosis would be increased. We will have to rely chiefly on the previous history of the case, as to the early signs of pregnancy. While in all probability a frequent show may have been noticed, there will have been no regular menstrual period, and the uterus will be found always larger than natural.

With tubal pregnancy the tumor will be found too well defined in shape, when compared to the condition resulting from an extravasation of blood between the folds of the broad ligaments; in this the blood tumor always becomes blended with the side of the uterus itself. In tubal pregnancy, however, the enlargement of the uterus and the frequent occurrence of a show, in the continued absence of the regular menstrual flow, will be found the most reliable symptoms.

During the formation of a hematocele there is never an elevation of temperature, as with cellulitis or peritonitis, but on the contrary the prominent features are those of depression. When an extravasation has taken place into the connective tissue, a finger in the vagina will only detect an irregular surface, due to the blood having met with more or less resistance in its course. On the other hand, when blood accumulates in Douglas's cul-de-sac, a smooth, rounded and well-defined mass will characterize the shape of this pouch, when felt from the vagina. This outline becomes lost in the event of either cellulitis or peritonitis, while inflammation imparts a degree of density to these tissues, which is never felt in connection with a simple effusion of blood.

A rare form of hematocele has been described which might be mistaken for inflammation of the broad ligaments or general cellulitis, if merely a superficial examination were made. It is when the blood has been thrown out in such a quantity as to distend the fold of one broad ligament, and then, instead of rupturing into the peritoneum, it dissects this membrane from the sides of the uterus, so as to pass into the cellular tissue of the other broad ligament. This general extravasation may put the parts so much on the stretch as to simulate somewhat the condition caused by inflammation. If such an extent of tissue was involved by cellulitis, the symptoms would be so different from those which have been detailed for hematocele that there would be no difficulty in making a correct diagnosis.

Treatment.—But little more can be added to this portion of the subject beyond what has been already given in the histories of the cases detailed. Surgical interference has been advocated by many, and its practice has been urged as a necessary procedure at an early stage. Unquestionably cases must occur when the surgeon would be wanting in a sense of duty if he did not assume the responsibility and puncture the mass. But with a large majority of cases such an interference would be criminal, as it needlessly places the life of the patient in jeopardy.

As a rule, nature makes a prompt effort to repair, by absorption, the result of this accident, and, unquestionably, the lesion occurs and is often removed without its existence having been suspected. Absolute rest in the horizontal position is the first indication, and this must be maintained until all danger of a recurrence of the hemorrhage has passed. The application of an ice-bag to the abdomen and the use of ergot have been recommended, but I doubt the value of either remedy. It is not improbable that any good effect from the use of cold in arresting the hemorrhage would be more than counterbalanced by the risk of exciting inflammation. Ergot in small doses may exert some effect on the coats of the bloodvessels if given hypodermically, while it would be apt to derange the stomach if taken internally.

I would trust more to a cool room, light bedclothing, absolute rest, and opium, if needed, with a moderately tight abdominal bandage. The tendency is to form a clot about the mouth of the bleeding vessel, which will do more than anything else to arrest the hemorrhage, if it is not disturbed. It will be prudent for the patient to remain quiet in bed during the approach of the next menstrual period, for fear of causing a recurrence of the hemorrhage.

As the rapidity with which the clot will be removed will depend upon the state of the general health, every effort must be made to improve it. The value of large and continued doses of the iodide of potassium in producing absortion of the clot has yet to be tested by further observation. Should cellulitis occur, the complication must be met on general principles, as if it were the original affection. The continued use, however, of hot water vaginal injections will not only lessen the liability to this complication, but will hasten materially the absorption of the clot.

CHAPTER XIII.

DISEASES OF THE PELVIC CELLULAR TISSUE.

Description of the tissues—The influence of cellulitis not fully appreciated as a cause of disease in the uterus and ovaries—Etiology—Symptoms and treatment of cellulitis—Tables showing the causes, complications, and location of cellulitis, and the condition of the menstrual flow as influenced by cellulitis—Symptoms—Treatment—Dr. Brickell's conclusions.

THROUGHOUT the pelvis, in the intervening spaces between the bladder, uterus, and rectum above, and about the vagina and rectum below, is found the cellular, or connective tissue. This tissue serves the purpose of steadying the organs, and from its elastic character it breaks, like a cushion, the force or jar which would otherwise be felt with every step. The bloodvessels and nerves are distributed by means of this tissue, which is well fitted for the purpose, from its peculiar web or sponge-like formation. Its character admits of a great degree of traction being exerted upward (as in pregnancy), or downward (as in prolapse), without impairing the integrity of either bloodvessels or nerves.

Above is found the peritoneum, reflected from the abdominal wall in front, over the anterior and upper third of the bladder, to the body and fundus of the uterus. Then dipping posteriorly, an inch or more below the vaginal junction, to form Douglas's cul-de-sac, it passes backward, to cover the anterior face of the rectum. The peritoneum thus invests the organs of the pelvis as any pliant covering would do, by dipping down sufficiently on all sides to conform to the general outline of the upper portion of these organs. As it thus passes down between the organs and over the Fallopian tubes, it includes a certain amount of this cellular, or connective, tissue between its folds, and with this and a few muscular fibres forms the uterine ligaments. The broad ligament includes the Fallopian tube on each side of the uterus. In the same manner, the utero-sacral ligaments are formed behind.

Inflammation of this tissue is generally termed cellulitis, which is sufficiently accurate for all practical purposes. The terms perimetritis, meaning inflammation of the pelvic peritoneum, and parametritis, expressing inflammation of the cellular tissue about the uterus, were recommended by Virchow. But these terms, like many others in use, express a theoretical distinction only, since the difference cannot be recognized in practice. At least, I must acknowledge my own inability to make any distinction at the bedside. It is inconceivable that inflammation of any portion of the pelvic peritoneum could exist without involving the cellular tissue in connection with it. Nor is it possible that extensive cellular inflammation could run its course without extending to the peritoneal covering, which is in such close relation with it. We certainly cannot have extensive cellulitis without pelvic peritonitis, which may become general.

A general peritonitis may involve the pelvic peritoneum, although this is not usual; or local inflammation may be excited by the contact of some solid or fluid material escaping from the uterus or its appendages. Yet, whatever the exciting cause may be, pelvic peritonitis cannot exist alone, but must rapidly involve the cellular tissue invested by it.

This inflammation may be confined to either broad ligament, to the posterior cul-de-sac, to the space between the uterus and bladder, or it may be general.

I do not exaggerate when I claim that this disease is by far the most important one with which woman is afflicted. It is the most common, and becomes the more important, in being comparatively seldom recognized. It seems scarcely possible that any one with the slightest experience could overlook an extensive cellulitis, whether confined to one side, or general in extent. At least the existence of some great pathological change ought to be detected under these circumstances, which of itself would be sufficient protection for the patient against any procedure likely to aggravate her condition. But I do not hesitate to make the assertion, as a truth based on my own knowledge, that many practitioners habitually neglect to recognize this condition, when circumscribed, or they do not appeciate its importance if by accident it be detected. Many of the disappointments and the bad results so often complained of in the management of the diseases of women, in general practice, may be attributed to the existence of unrecognized cellulitis. Its undetected presence may, to the end, thwart all efforts of treatment, or may gravely complicate the case by suddenly developing to a most serious extent. A great advance in the treatment of the diseases of women will be made whenever practitioners become so impressed with the significance of cellulitis as to apprehend its existence in every case. The successful operator in this branch of surgery will be he who is always on the lookout for the existence of cellulitis, or who is taking measures to guard against its occurrence.

When a patient is examined for the first time, the starting point should be to determine the existence of the slightest trace of cellulitis. This knowledge is absolutely necessary before we can, with safety, conduct the subsequent steps of the examination. When the finger is introduced into the vagina, it should be passed first to one side, and then to the other of the uterus, to detect any existing thickening in either broad ligament, which would indicate this disease. If the neck of the uterus were found drawn to one side of the vagina, this we would recognize as the effect of a former attack of cellulitis, which resulted in shortening of the ligament on that side. With one hand over the abdomen, and the index finger of the other in the vagina, it will be easy to judge of the extent of thickening, or whether the disease be still smouldering, as it were, as evidenced by the pain produced on pressure. The posterior cul-de-sac must be afterward subjected to the same careful examination. The investigation is to be completed by introducing the finger into the rectum, where we may detect, from the tenderness excited on pressure, any local inflammation in the upper part of the broad ligament. The examination by the rectum should never be omitted, for extensive disease might exist in the upper part of the broad ligament along the course of the Fallopian tubes, or in the ovaries, which could not be recognized from the vagina. During the course of the examination thus conducted, the position, size, and mobility of the uterus can be accurately appreciated.

Inflammation of the pelvic cellular tissue may exist in any degree from simply a point of tenderness, only to be detected on pressure, to a general cellulitis. The impression conveyed to the finger by the latter condition, would be as if the cellular tissue, while in a fluid state, had been poured into the pelvis about the organs, and, after filling every interstice, had become solid. When the inflammation has been confined chiefly to the peritoneum, and the cellular tissue connected with it, the anterior wall of the vagina will become tense from the lateral traction exerted by the inflamed tissues. The sensation then conveyed to the finger would be as if a cardboard blocked up the pelvic canal, and the neck of the uterus would be felt fixed and as if presenting through an opening barely large enough for its passage. This condition would represent inflammation of the pelvic roof, involving the peritoneum throughout the pelvis in a plane extending from the sub-pubic ligament to the attachment of the utero-sacral ligaments at the sacrum. The most frequent site for cellulitis, when limited in extent, is under the posterior face of the broad ligament in close proximity to the cervix. It is most frequently found in the left broad ligament, or extending backward along the right utero-sacral ligament. Whenever a prolapse occurs, or a retroversion, the seat of greatest irritation must be near the attachment of the utero-sacral ligaments to the uterus, where the weight or traction is centralized. In case of injury to the cervix from childbirth, or from any surgical procedure, followed by inflammation, cellulitis readily occurs between the folds of the broad ligaments. This is easily explained from the fact that the cellular tissue becomes so blended with the tissues at the point of junction of the cervix and vagina, that from the contiguity it could not escape. The process of repair is usually more active in the cervix than it is in the neighboring cellular tissue, so that the products of inflammation are likely to remain long after the exciting cause has disappeared. It may then require but a slight provocation to light up, as it were, into a flame, a condition which, in all probability, had been unsuspected.

If a thickening at any point can be detected, or an unusual amount of pain be elicited from pressure of the finger, the prudent operator will recognize its full import. It would be inadmissible, under such circumstances, to institute any surgical procedure, or to attempt the replacing of the uterus if it be retroverted, to introduce the sound, or to make any application within the uterine canal. We must employ the necessary means for relieving the condition of the circulation, and by having the case under observation, the proper course to be followed will be soon plainly indicated.

Much has been already accomplished by different observers, but I am confident that the greatest advance yet to be made in this branch of surgery, will be from the intimate study of the cellular, or connective, tissue of the pelvis. We will there find, I am convinced, the key to many of the pathological changes now treated as uterine disease, and it will be shown that hitherto we have confounded cause and effect. I have long sought to fully solve this problem, but have found it beyond the scope of a single observer, yet I may be the means of pointing out the direction in which the solution lies. Since I have understood the action of hot water vaginal injections, I have realized that this remedy is destined to overturn both the theory and therapeutics of uterine disease, as now accepted.

Experience teaches that hot water is indispensable in the treatment of all uterine disease, and, since it only affects the supposed disease indirectly after giving tone to the bloodvessels in the connective tissue of the pelvis, we may fairly raise the question as to the original seat of disease.

It is the view, generally advanced by the writers of our day, that the occurrence of cellulitis is secondary to some exciting cause in the uterus, or to some disease in the Fallopian tubes or in the ovaries. It has even been maintained that inflammation could not have a beginning in the cellular tissue.

My convictions are that while the primary cause of disease lies, through the influence of the sympathetic system, in impaired nutrition, we must look to pathological changes in the connective tissue as the cause of the results we now regard as the original disease in the uterus and ovaries.

These views have no reference to the lesions incident to the puerperal state, for there I recognize that, for the time being, the uterus is the dominant power. Pathological changes are then brought about in the connective tissue of the pelvis as secondary to the uterine condition, and may remain long after the original causes have disappeared. But these pathological changes may afterwards so far affect the circulation, either mechanically or through the nervous system, as to excite in time other uterine disease.

In no other portion of the body, within the same extent of space, can be found the same number of bloodvessels or nerves as are distributed to the pelvic connective tissue. These vessels are doubled upon themselves to an almost incredible degree, so that they cannot be put on the stretch, or their calibre lessened by the traction from pregnancy or uterine displacement. This provision is, however, a source of weakness, should local nutrition become impaired, since a great portion of the blood contained in a woman's body may become almost stagnant in the vessels of the pelvis.

We are told that cellulitis is generally due to metritis or ovaritis. It is unquestionably true that we may and do have metritis in the puerperal state exciting cellulitis, but I deny that we ever have inflammation of the uterine tissue under any other circumstances. I have never found pus in the uterine tissue, nor any other evidence of inflammation after death, in any form of uterine disease, except in connection with childbirth or malignant disease. I have never seen a case of ovaritis without inflammation of the neighboring tissues, and where I have had the opportunity of observing one early enough, I have always detected the cellulitis before the ovary became involved. We have no means of judging with any accuracy as to the condition of the Fallopian tubes during life. But the probabilities are, unless poisoned in the first instance by some foreign irritant, as by gonorrhœa, that inflammation of its mucous membrane, with that of the uterus, is secondary to some previous lesion in the cellular tissue. This view is not an irrational one, since, if the uterus is not impregnated, for equal extent of space, the cellular tissue is much more abundantly supplied with bloodvessels and nerves than is the uterus. The uterus is entirely dependent on the blood, which is first distributed through the connective tissue, and its nerve-fibres reach the organ by the same route. I hold that the cellular tissue is the first and most exposed to influences exerted through the bloodvessels, and consequently it is the more liable to become inflamed, just as, for instance, he who transports nitro-glycerine is more exposed to danger than he to whom it is to be delivered.

To illustrate: the circulation in a portion of the cellular tissue may become obstructed from some cause, with the effect of producing congestive hypertrophy of the uterus from partial stagnation. One of the first efforts of nature would be to temporarily relieve this condition by an increase of secretion from the mucous follicles. As this discharge continued to flow over a surface, the epithelium would at length be lost, and what has hitherto been termed ulceration would be produced. It has been the accepted practice, even to the present time, of applying caustic remedies to such a surface until the character of the tissue became destroyed, when, of course, the discharge would cease, with the original condition, however, remaining unchanged. I hold it to be more rational to restore first the circulation in the cellular tissue, after which the hypertrophy of the uterus will rapidly diminish, the discharge will cease, and the so-called "ulceration" heal without further care.

An elaboration of these views might have been more in place while considering the general principles, but they have been presented intentionally in the present connection, that they may be the more forcibly impressed. Injuries of the pelvic cellular tissue will be treated of under the heads of cellulitis, pelvic abscesses, and hematocele.

ETIOLOGY OF CELLULITIS.

The causes of inflammation of the cellular or connective tissue of the pelvis may be classed as puerperal and accidental.

It may be claimed that many of the injuries of childbirth are accidents, and, to a certain extent, this is true, so far, at least, as regards the exciting cause. But the puerperal state is one in which the connective tissue is not only liable to injury from pressure and from laceration, but to inflammation extending from the veins of the uterus to those in the connective tissue. From the great increase in vascularity of the parts, the woman is then the more liable to, and the less able to resist, the effects of local injury, which, in the non-puerperal state, would be productive of but little disturbance.

I am deeply impressed with the belief that future observation will establish the fact that phlebitis is a common factor in pelvic cellular inflammation. We have yet to learn the determining element which in one instance will cause phlebitis, and in another, inflammation of the cellular tissue itself. The connective tissue, of course, becomes more or less involved with phlebitis, but the extent of inflammation in the other condition is more decided, and is accompanied by intense arterial congestion. That phlebitis in the pelvic cellular tissue does exist in connection with the puerperal state, as taught by Trousseau, I have verified in early life, when my opportunities were better for studying these pathological changes; but it must be left to future observation to determine how it occurs in the non-puerperal condition, for I have had no opportunity of establishing this point.

But a very moderate amount of experience would be sufficient to impress any observer with a belief in the existence of a marked difference in the forms of cellulitis, a difference which cannot be dependent on either locality or changes in the general condition. A most extensive phlegmonous cellulitis may be detected after childbirth, which will sometimes rapidly disappear within the course of a few days, and we frequently meet with like cases in the non-puerperal state. On the other hand, a less extended inflammation, following a lacerated cervix, for instance, may last for years, and we may find exactly the same condition and result after exposure to cold. It is in consequence of these great differences that I am impressed with the belief that the immediate exciting causes of the inflammation cannot be the same under all circumstances. We may have the most extensive inflammation rapidly disappearing, coincident with, or as consequent upon, a certain course of treatment. Yet, in a similar case, or with the patient in even better general health, the local condition will remain for months or years unchanged. We have yet to ascertain what the predisposing condition is, since the most insignificant exciting cause may, in some instances, be followed by the most disastrous results, and in others be absolutely without bad effects. A low grade of phthisis, it is believed, may remain for an indefinite period, and its existence in the cellular tissue is the most rational explanation which can be offered for the occurrence of these sudden complications.

We shall consider briefly the statistical history of some three hundred and three cases of cellulitis treated in my private hospital.

The average age of puberty was 14.02 years, and that of marriage, for the fruitful women, was 19.84, and they are both almost identically the same as was obtained for the general averages. But the average age of marriage for the sterile women was 22.88 years, which is nearly three years later in life than the general average on all women. The average number of children was but 1.86, and, including the miscarriages, we have but an average of 2.15 pregnancies for each woman. Both of these averages are much below those obtained on the total number of all women under observation. This is certainly an indication of the fact that cellulitis is a cause of sterility, and this is corroborated by the average length of time since the last pregnancy, which was found to have been 6.69 years. The average age at the time of the first consultation was 29.44 years for the fruitful, 31.43 years for the sterile, and 27.38 years for the unmarried women. This would show that the average age for the fruitful, at the termination of the last pregnancy, was 22.75 years.

Of the total number of cases of cellulitis under observation, 157, or 51.81 per cent., had no uterine or ovarian disease which could be detected. If any form of these diseases had been the exciting cause of the cellulitis, all traces had disappeared, so as to leave only the product. The remaining 156 cases suffered from other lesions in addition to the cellulitis. The supposed causes of the cellulitis will be given as reported by those patients where no uterine disease could be detected when first examined.

The first feature presenting itself in Table XIV., in regard to the liability to the disease, is that the proportion of unmarried and sterile women is greater, and that of the fruitful women is nearly fourteen per cent. less than the general average for all women under observation. The greater number of the unmarried women traced their diseases to exposure and imprudence in dress, and the proportion I do not believe is over-estimated. Almost as large a percentage of sterile women attributed their bad health to the marriage state, in other words they suffered the penalty for violating, in some manner, the laws of nature. Nearly all the fruitful women had suffered since the termination of pregnancy. It is a melancholy fact, as shown, that of forty-six women who suffered from cellulitis, and could assign a cause, over twenty-three per cent. acknowledged to have undergone criminal abortion. This percentage, I believe, would be much under the actual proportion were we able to designate the "unknown causes." The same would be applicable to the sterile women, in so many of whom cellulitis was excited in consequence of their having employed some means to prevent conception. To the use of the sewing machine, as one of the causes, I am satisfied too small a proportion has been attributed. This instrument is in such general use, and so little regard is paid to the importance of not using it during the menstrual period, that we cannot over-estimate its injurious effects. It should be used with the greatest judgment by the most robust women, while, for the delicate no more certain means could be devised for producing disease.

TABLE XIV.—*Supposed Causes of Cellulitis, uncomplicated with other local disease.*

Causes.	Unmarried.	Sterile.	Fruitful.	Total.	Percentage.
Married life	......	14	......	14	8.91
Childbirth	......	......	21	21	13.37
Miscarriage	......	......	11	11	7.00
Criminal abortion	......	......	11	11	7.00
Exposure to cold	11	6	2	19	11.79
Excessive study	1	1	......	2	1.21
Falling down stairs	5	1	1	7	4.45
Sewing machine	1	1	......	2	1.21
Sudden fright	1	1	......	2	1.21
Unknown causes	17	30	21	68	43.64
Total	36	54	67	157	
Percentage	22.93	34.39	42.67	......	51.81

Another factor in causing cellulitis, viz., that of rupture of blood-vessels, does not appear in the record, since the patient would be ignorant of the occurrence. Yet, a very superficial study of the circulation through the pelvis, even in health, would be sufficient to convince any one that this accident cannot be a rare one. Extra-uterine pregnancy, rupture of cysts, and the escape of any foreign body into the peritoneal cavity, are all capable of producing pelvic peritonitis and general cellulitis. But this has been already referred to in the chapter on hematocele.

In Table XV. are presented the different diseases which were found in complication with cellulitis. Displacements of the uterus form over fifty-four per cent. of the lesions found to be accompanied with cellulitis. The next most important accompaniment was laceration of the cervix, which, by extending into the connective tissue of the pelvis during childbirth, readily produced cellulitis. The result was one which often follows laceration, the patient being liable for a long time after the reception of the injury to fresh attacks of cellulitis, which may come on from the slightest provocation. The product of this inflammation, or the condition remaining after an attack, is generally situated in the broad ligament, on the same side on which the laceration occurred through the cervix. Its presence there is seldom recognized, in consequence of an incomplete examination. It is to be noted, also, that it may be readily set up by an unskillful examination, by dragging down the uterus, or on using any other undue violence.

TABLE XV.—*Different Diseases in Complication with Cellulitis.*

Cellulitis with other diseases.	Unmarried.	Sterile.	Fruitful.	Total.	Percentage.
Versions	3	17	25	45	30.82
Flexures	2	20	10	32	22.59
Laceration of the cervix .	......	......	26	26	17.80
Fibroids	......	5	11	16	10.96
Hæmatocele	......	2	3	5	3.42
Early atrophy of the uterus	4	1	......	5	3.42
Prolapse of the ovary . .	1	3	......	4	2.73
Contraction of the os uteri	1	1	1	3	2.05
Ovarian tumor	1	......	1	2	1.36
Fibrous tumor	......	2	......	2	1.36
Fibro-cyst	......	......	1	1	.68
Rectocele	......	......	1	1	.68
Procidentia	......	......	1	1	.68
Lacer'n of the sphincter ani	......	......	1	1	.68
Cystitis	1	......	......	1	.68
Change of life	1	......	......	1	.68
Total	14	51	81	146	
Percentage . . .	9.58	34.93	55.02	48.18	

By Table XVI. is shown the relative frequency of location of the cellulitis, with the changes in the length and quantity of the menstrual flow. The record is perfect so far as relates to the cases of uncomplicated cellulitis, but the location was not noted where the disease was associated with other lesions. The more frequent occurrence of cellulitis on the left side is particularly remarkable. Of one hundred and fifty-seven cases of uncomplicated cellulitis, forty-one per cent. occurred on the left side, and only ten per cent. on the right side. General cellulitis was next in frequency of occurrence; then, in order, followed inflammation behind the uterus, and lastly, on the right side, and pelvic abscesses, which were found to be of the same relative

TABLE XVI.—*Menstruation as affected by Cellulitis.*

Location of the cellulitis. (Uncomplicated.)	Period remained unchanged as to time and quantity, being from the beginning, either										Length of period remained unchanged, but the quantity became afterwards, either												Length of period became prolonged, with the quantity, either									
	Normal			Too free			or Scanty.				Increased			Lessened			or Irregular.						Increased			Lessened			or Irregular.			
	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Total.	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Total.	Number.	Per cent.	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Total.
General	...	1	4	1	...	...	2	...	...	8	2	...	1	...	...	1	2	...	1	7	15	15.62	3	1	2	...	...	...	...	...	2	8
Behind the uterus	1	3	1	...	...	...	...	...	...	5	1	1	1	1	2	2	...	1	1	10	15	15.62	...	1	2	...	...	...	...	...	1	4
Left broad ligament	1	3	5	1	3	...	1	2	3	19	2	4	4	2	4	2	...	3	2	23	42	43.75	2	3	2	...	...	...	...	...	...	7
Right broad ligament	1	...	1	...	1	...	1	2	...	6	2	...	1	...	1	2	...	...	...	6	12	12.47	...	...	1	...	...	..	...	...	...	1
Pelvic abscess, locality not given	..	1	2	...	...	...	..	...	...	3	...	1	1	1	1	3	...	2	...	9	12	12.47	...	...	..	...	...	...	...	...	...	...
Total	3	8	13	2	4	...	4	4	3	41	7	6	8	4	8	10	2	6	4	55	96	....	5	5	7	...	...	...	...	...	3	20
Percentage	24 16.32			6 4.08			11 7.48			.... 27.89	21 14.28			22 14.96			12 8.16			.... 37.41	....	.... 65.30	17 11.56			....			3 2.04			.... 18.60
Cellulitis complicated with other diseases. Total	3	8	19	...	1	4	1	4	3	43	1	7	21	2	7	6	...	1	5	50	93	....	...	9	7	...	1	2	...	1	1	21
Percentage	30 21.27			5 3.54			8 5.67			.... 30.49	29 20.56			15 10.63			6 4.25			.... 35.47	....	.... 65.24	16 11.34			3 2.12			2 1 41			.... 14.89
Total number of all cases	6	11	32	2	5	4	5	8	6	84	8	13	29	6	15	16	2	7	9	105	189	....	5	14	14	...	1	2	...	1	4	41
Percentage	51 13.75			11 3.81			19 6.59			.... 29.16	50 17.36			37 12.84			18 6.25			.... 36.45	.... 65.62	....	33 11.45			3 1.04			5 1.75			.... 14.23

TABLE XVI.—*Continued.*

Location of the cellulitis. (Uncomplicated.)	Length of Period became Lessened with the Quantity, either										Total with both time and quantity changed.		Change of life had taken place previous to the attack.				Summary.						Total number and percentage.	
	Lessened			Increased			or Irregular.										Single.		Sterile.		Fruitful.			
	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Total.	Number.	Per cent.	Single.	Sterile.	Fruitful.	Total.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
General	1	4	2	...	...	1	...	...	2	10	18	35.29	....	2	3	5	11	30.55	8	14.63	19	28.25	38	24.20
Behind the uterus	...	...	...	...	...	...	...	...	...	....	4	7.84	1	1	....	2	4	11.11	9	16.66	8	11.94	21	13.37
Left broad ligament	3	3	5	2	1	...	...	...	1	15	22	43.13	....	1	....	1	14	38.88	27	50.00	24	35.82	65	41.40
Right broad ligament	2	...	1	...	...	...	...	...	...	3	4	7.81	....	....	....	....	6	16.63	4	7.40	6	8.95	16	10.19
Pelvic abscess, locality not given	...	1	2	...	...	...	...	...	...	3	3	5.88	....	....	2	2	1	2 77	6	11.11	10	14.92	17	10.82
Total	6	8	10	2	1	1	...	...	3	31	51	....	1	4	5	10	36	....	54	....	67	....	157	
Percentage	24 16.33			4 2.72			3 2.04			.... 21.08	....	.... 34.69	10			.... 6.36	....	... 22.93	....	.... 34.39	....	.... 42.67	....	51.81
Cellulitis complicated with other diseases. Total	2	11	10	...	...	2	2	...	...	27	48	....	3	1	1	5	14	....	51	....	81	....	146	
Cellulitis complicated with other diseases. Percentage	23 16.31			2 2.72			2 1.41			.... 19.14	....	... 33.97	5			.... 3.42	....	.... 9.58	....	.... 34.93	....	.... 55.47	....	48.18
Total number of all cases	8	19	20	2	1	3	2	...	3	58	99	....	4	5	6	15	50	....	105	....	148	....	303	
Percentage	47 16.31			6 2.08			5 1.73			.... 20.13	....	.... 34.37	15			.... 4.95	....	.... 16.50	....	.... 34.65	....	.... 48.84		

frequency. There is little to be noted as to the relative frequency of cellulitis in any special locality, according to the conditions of life, unless the result of accident. But under the head of pelvic abscess we find that of seventeen cases only one occurred among the unmarried, a proportion too small to have been accidental.

For the purpose of showing the changes in menstruation, the usual form has been followed in the table. Two divisions are first made, showing that one hundred and eighty-nine cases remained, after the cellulitis, unchanged as to the length of the flow. With ninety-nine cases, forming the second group, both time and quantity became changed. Eighty-four of those forming the first division, representing 29.16 per cent. of the total, underwent no change either as to time or quantity. The menstrual flow remained the same as it was before the attack of cellulitis, whether normal, too free, or scanty. We must, however, acknowledge our ignorance of the causes which, under apparently similar circumstances, determine changes in the quantity of the menstrual flow after an attack of cellulitis. Whatever these are, it is manifest, from the remarkable uniformity in the percentages, whether taken on the uncomplicated or complicated cases, that they are influenced by the character of the cellulitis.

TABLE XVII.—*Condition of the Menstrual Flow after Cellulitis.*

Condition of the menstrual flow after cellulitis.	Uncomplicated.		Complicated.		Total.	
	Cases.	Per cent.	Cases.	Per cent.	Cases.	Per cent.
Normal	24	16.32	30	21.27	54	18.75
Too free, or increased	48	32.64	52	36.87	100	34.72
Scanty	11	7.48	8	5.67	19	6.59
Lessened	46	31.29	41	29.07	87	30.20
Irregular	18	12.24	10	7.09	28	9.92
Total	147	....	141	....	288	....

A glance at Table XVII. will show the menstrual changes in quantity, without regard to the length of the flow. A comparison is given, at the same time, as to the relative frequency of these changes between the uncomplicated cases of cellulitis and those which were complicated with other diseases. It is shown that the quantity remained normal with 18.75 per cent., while the flow in a larger proportion of cases (but in nearly equal numbers), in comparison with each other, became either increased or lessened. The apparent discrepancy between the total numbers, as shown in Tables III. and IV., is due to the fact that, in the latter, fifteen cases of cellulitis, occurring after the change of life, are not included.

As a proof of the assertion that cellulitis was due to uterine or ovarian disease existing during the menstrual life, it has been held by different authorities that it does not occur after the change of life. I have, in consultation, met with two cases of cellulitis in the child between eight and ten years of age, and before any evidence of approaching puberty existed. My private hospital records show that I have had under my care fifteen cases of cellulitis occurring after the change of life. All of these were between forty-five and fifty-five years of age; in one of them the menstrual flow had ceased eleven months previous to the attack, and in another, an interval of seven years had elapsed. The number of cases I have given constitute about five per cent. on the total of all cases of cellulitis passing under my observation. The lesion is, beyond question, a rare one after the change of life, in consequence of the difference in the character of the tissues, and because the quantity of blood going to the parts then becomes reduced to just what is necessary for nutrition. But there is certainly no ground on which to base a theory of immunity after the menopause, since every portion of the human body may, under favorable circumstances, become inflamed. Two of these cases I treated for pelvic abscess; one had previously suffered for several years from senile vaginitis, and the other had married a second time, and late in life, a man much younger than herself. These patients were unable to give any explanation for the cellulitis, but I noted these circumstances at the time, as indicating, in all probability, the exciting causes.

Symptoms of Pelvic Cellulitis.—An attack of cellulitis is generally ushered in by a chill of more or less severity, followed by fever. But, at times, the attack begins with pain and fever without any perceptible chill. Again, extensive cellulitis is occasionally detected by accident, after having become already well advanced without causing any particular disturbance. Fever and pain about the lower portion of the abdomen are, however, the usual symptoms. The pulse will become greatly increased in rapidity, and the thermometer, if placed in either the axilla or mouth, will indicate a marked elevation in temperature. As the temperature is usually at least one degree higher in the vagina, during an attack of local inflammation, it is better for the sake of greater accuracy to make the observation in the vagina. Unless the inflammation be very extensive, so as to involve the peritoneum, the symptoms are not always well marked, nor do they follow closely any rule.

If the attack be a severe one, there will be tenderness over the lower portion of the abdomen to either side, or over the whole surface. The abdomen will be found tympanitic and intolerant to pressure, while the patient will lie on the back with the knees well drawn up, and unable to extend them without increasing the pain. These symptoms are found accompanying an attack of hysteria, and this disturbance of the nervous system may even be an additional complication with the cellulitis. But the elevation of temperature, as indicated by the thermometer, is an important diagnostic sign, since there is no such change in hysteria.

Nausea may exist early in the disease, but vomiting, with the ejection of bile in large quantities, indicates a serious extent of the disease, with general peritonitis. As the cellulitis becomes overshadowed by the extension of the peritonitis, the extent of the latter will be indicated by the expression of the patient's face, and by the tone of her voice. The features will become more pinched, and the voice will resemble closely that characteristic of the collapse of cholera. When the peritonitis has been unusually rapid in its progress, it seems to sear its way as with the white heat of a cautery, and to destroy sensation. I have seen such inflammations begin as a cellulitis, extend to the peritoneum, and, becoming general, run their course in a few hours, without the slightest local suffering or even pain on pressure. From the shock and rapid depression to the life force, the temperature will fall even below the normal standard, while the pulse will rapidly increase, since the heart, from a loss of power, is now obliged to make a greater number of contractions. That the temperature should go down as the pulse increased in frequency is apparently an anomaly. The rule is, however, as applicable to all conditions of rapidly failing power. The explanation lies, at the beginning, in imperfect aëration of the blood in the lungs, from which the capillary circulation becomes diminished in proportion as the needed stimulus of oxygen is deficient. A depression in temperature on the surface would naturally follow, while the heart, although enfeebled, must increase its frequency of action to get rid of the accumulation of blood. Experience has taught me that, in any acute disorder, it is the beginning of death when the temperature of the body falls below a point which is disproportionate to the extent of the disease, the pulse, at the same time, becoming rapid and equally out of proportion. In such cases of peritonitis this is an infallible indication of the beginning of the end, notwithstanding the strength of the patient may yet seem fair, and other grave symptoms be absent.

In other cases, after a certain interval, there will be a remission of fever, but never a marked intermission until the commencement of resolution or convalesence. The pyrexia will continue above the normal point in the vagina, although the heat of the skin may seem natural, while, towards the close of the day, there will always be a perceptible rise in the general temperature. The symptoms will all be marked just in proportion to the extent of the peritoneum involved, and, in extreme cases, the pelvic condition may be masked entirely by the symptoms of general peritonitis. In fact, without the aid of a digital examination, the extent of the cellulitis would remain unknown.

The first shock of the disease is spent on the nervous system, whether the exciting cause be blood-poisoning, extension of the inflammation over a greater area, or the sudden occurrence of cellulitis itself. We can only recognize the result of the shock by the chill, during which the blood flows from the surface to the internal organs, producing intense pelvic congestion. Nature's first effort to relieve this will be by the escape of the watery portions of the blood through the coats of these vessels, so that the tissues become infiltrated with serum. Then reaction comes on, by which the circulation is partially restored, and the fever correspondingly subsides. If the finger be now introduced into the vagina, no hardening of the tissues can yet be detected, but the sensation of a fulness and a baggy feeling will be appreciated, and there will be a marked elevation of temperature.

As the disease advances, so as to involve the peritoneum, the uterus becomes fixed in its position, and the roof of the pelvis tightened, as I have described. With this process, plastic lymph is thrown out, opposing sides of the peritoneum adhere and inclose the inflammatory products. Then the finger in the vagina will be able to detect roughened surfaces, as if hard masses of some foreign substance had become inclosed within the pelvic tissues.

When reaction occurs, if the circumstances are favorable, the œdema of the tissues rapidly disappears, and these hard masses melt away, as it were. The uterus soon becomes again movable, and the only product of the inflammation remaining afterwards will be a band formed from the shrinkage of the tissues which had been involved. Should the uterus or the intestines be bound down by adhesions, the former can be relieved and replaced by art, while the peristaltic action will in time liberate the latter. But the damage will be almost irreparable whenever the ovaries have been involved, or the broad ligaments, if of sufficient extent to include the Fallopian tubes. As the ovaries are stationary, they will remain buried in the lymph, which has been thrown out, and they may become atrophied. By contraction of these bands, the needed supply of blood becomes cut off, and atrophy must follow. Nerve filaments are often involved in the mass and are compressed by contraction, with the effect of causing ovarian neuralgia or reflex irritation elsewhere. To attacks of cellulitis, which may have produced but little disturbance at the time, can be traced the chief causes of sterility. The ovary may become covered in by a mass of lymph, as has been stated, so that the ova cannot escape from the Graafian follicles. The fimbriated extremity of the Fallopian tube may have been bound down or so displaced by adhesion, as to be no longer able to grasp the ovary for the purpose of receiving the ovum as it escapes from the ovarian stroma. Or, some portion of the Fallopian tube may become obliterated by a band of adhesion. Moreover, these consequences are by no means dependent upon the apparent gravity of the attack.

After subsidence of the attack, if nature, alone or aided by art, be unable to remove the products of the inflammation, symptoms of blood-poisoning present themselves, in consequence of the absorption of septic material into the general circulation, as if it were nature's last effort to restore the integrity of the parts. The patient now suffers from rigors, followed by fever, and with but a slight remission of these symptoms at any time in the day. The encysted lymph and serum break down into pus, which, infiltrating the neighboring tissues, acts as a foreign substance, and sets up a fresh inflammation, causing their degeneration. A number of small accumulations of pus thus formed, at length coalesce into one or more large abscesses. These accumulations of pus extend in the direction presenting the least resistance, and generally empty themselves unaided. The most frequent point of escape is into the posterior cul-de-sac of the vagina, or, if from either broad ligament, a little to one side and posterior to the cervix. These abscesses rupture almost as often into the rectum, and with less frequency into the bladder. Occasionally the contents of an abscess may escape into the small intestines, in consequence of some adhesion, or it may follow the course of the psoas muscle, and open at the groin. It is the least likely to rupture into the peritoneal cavity, since it requires so little irritation to produce adhesive inflammation of this membrane that it would be protected in advance. Should this accident occur, the shock would be necessarily great, fresh inflammation would be excited, and there could be no safety for the patient unless it proved the means by which the pus could again become encysted.

In rare instances, the pus may pass from the pelvis through either sciatic foramen, and burrow under the glutei muscles, or in the neighborhood of the hip-joint. In many instances the escape of pus will continue only for a limited time, and, as the point of rupture is generally at the most dependent portion, the abscess is kept empty, its cavity shrinks, the walls adhere, and the discharge gradually ceases. The symptoms of blood poisoning rapidly disappear, and the restoration to health is unobstructed.

Under other circumstances, the hectic fever and blood-poisoning increase, and the discharge becomes more abundant. This occurs when the walls of the abscess happen to be so thick that they cannot be brought into contact, or when its cavity cannot be reduced after the escape of its contents. The whole interior then becomes a pus-secreting surface, and the disease proves a serious hindrance to the recuperative powers. Under no other circumstances does a woman show to greater advantage her natural tenacity of life and powers of endurance. I have seen this drain kept up for two years, and with a degree of hectic and emaciation unequalled in the course of any other disease, and yet recovery took place.

I have met with several instances where a collection of pus had become sacculated, and, without producing any constitutional disturbance, had remained in this condition for years, as I had every reason to believe from the history of the cases. An accumulation of pus in the neighborhood of the uterus, with thickened inflamed tissues about it, has been frequently mistaken for a fibroid with a supposed recent attack of cellulitis.

The following history of a case[1] is of interest in this connection.

CASE XV.—Mrs. E. K., aged twenty-nine, was admitted to the Woman's Hospital Nov. 9, 1868. She had given birth to her first child, without complication, and remained in good health until some five years previous to admission, when she was delivered of twins by a somewhat tedious but otherwise natural labor. Shortly afterwards she consulted an eminent physician of New York, for the relief of a feeling of discomfort experienced whenever she assumed the upright position. Her difficulty was recognized as due to the existence of a fibrous tumor on the posterior wall of the uterus, and to its presence was attributed her previous tedious labor. Some two years afterwards she gave birth to her last child by a natural although equally tedious labor. Her recovery was slow, and she was confined to her bed for six weeks before she regained her strength. On resuming her household duties she became conscious that her local difficulties had increased. For the first time she suffered from a continued irritation of the bladder, aggravated whenever she stood on her feet. Three years before her admission, she sought the advice of another physician, equally skilled, who confirmed the previous diagnosis. Although her general health remained good, the irritation of the bladder gradually increased, until she came under my observation.

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[1] "A Case of Faulty Diagnosis," etc., presented at the meeting of the State Medical Society, 1869, and published in the N. Y. Medical Record, Feb. 1, 1869.

I found a cystocele existing, which presented at the labia, and was due to the crowding forward of an enlarged uterus, which was partially retroverted from what seemed to be a large nodulated fibrous tumor on its posterior wall. By placing the forefinger of one hand in the vagina, and with the aid of the other over the relaxed walls of the abdomen, I was able, without difficulty, and without producing pain, to antevert the uterus. As I elevated the cervix on the point of my finger, while the fundus was thrown forward against the pubes, I made the tumor evident to several gentlemen connected with the Institution. By this means I showed with what facility the size and relation of the tumor to the uterus could be accurately mapped out through the abdominal wall.

December 1. I operated for the relief of the cystocele, turning in the excess of tissue by bringing together the denuded surfaces with interrupted silver sutures. On removing the sutures, the line of union was found perfect, with the exception of half an inch near the neck of the bladder, where several sutures had torn out. After a few days, she sat up, without having had a bad symptom, but did not regain her strength rapidly. She was, however, entirely relieved of all irritation of the bladder, and she considered herself cured.

On Friday, Jan. 22, I closed the small opening in a few moments with four sutures, and without ether. The tissues which I had turned in had protruded through this opening, and I feared that this might cause the whole line gradually to separate. Nothing unusual occurred in her condition until Sunday afternoon, when she had a slight movement from the bowels, which was exceedingly offensive. Shortly afterwards, the expression of the patient's face indicated that some trouble was brewing, but there were no special symptoms to indicate what it was. The pulse was ninety-five per minute, the skin and tongue in a normal condition, and the abdomen free from tenderness on pressure.

No change took place until five o'clock, Monday afternoon, when suddenly she had two copious, fetid evacuations per rectum. The pulse rose rapidly to 170, the tongue became dry, the body covered with a clammy sweat, and she sank into a profound collapse. By means of stimulants, heat to the extremities, and constant friction to the surface of the body continued during the night, she partially rallied. During Tuesday her condition improved somewhat, but she then began to show symptoms of blood-poisoning. About seven P. M. she suddenly had another large offensive evacuation from the bowels which was now recognized as pus. She sank rapidly, and died shortly afterwards.

The following morning a post-mortem examination was made. On opening the abdomen, the peritoneum was found in a healthy condition. The supposed fibrous tumor proved to have been a large abscess, with several smaller ones in connection with it, between the peritoneum and uterus, and it had ruptured into the rectum. These abscesses were encysted within a common sac, and free from adhesions above, except, at one point, to a portion of the small intestines, in the separating of which, for removal, the large sac was entered. The other adhesions extended along the bottom of the cul-de-sac, from the uterus to the rectum. Some thickening of the left broad ligament was found which had resulted from a previous attack, but the surrounding tissues were entirely free from any appearance of recent inflammation. The other organs were in a healthy condition; the brain was not examined.

In regard to the diagnosis, I fear that I would be liable to fall into error in any similar case not presenting a previous history more to the point, and where the patient was in good health, the uterus being somewhat enlarged, and menstruation more profuse than natural. The absence of fluctuation was due to the density of the outer cyst, while the mobility of the uterus, the mass in connection with it, and its nodulated surface, added greatly to the perplexity. My diagnosis was made after a careful examination, and without any knowledge whatever of the opinions which had been previously given in her case. In fact, I did not learn until after her death, that she had consulted other gentlemen. The statement was then made to me by her friends, as I was endeavoring to trace her previous history in regard to the time of formation of the abscess.

The point of interest in her case lies in the fact that she had been a healthy woman, attending to her daily duties for at least three years previous to admission. During this time she had suffered from no inconvenience beyond that to be attributed to the existence of the cystocele, which was entirely relieved by the operation. She dated the beginning of her troubles to the birth of twins five years before admission; and it was thought her tedious labor was due to the fibrous tumor detected shortly afterwards. Her difficult labor two years subsequent to the first would be naturally explained by the presence of the mass behind the uterus, which was also pronounced at this time a fibrous tumor. After this time, during the three years previous to my first examination, the irritability of the bladder was constant, except while she was in the recumbent position. The inference is, therefore, a natural one, that a mass had existed behind the uterus for at least five years. The question as to its character at once presents itself—either these abscesses formed after labor, or they were a result of the breaking down of a fibrous tumor, producing no constitutional disturbance or recognized local inflammation. From my examination of the specimen, my impression is that they were primary abscesses, for I am not aware that such a change taking place in a fibrous tumor has been observed or placed on record.

Examples are not wanting in other parts of the body. For instance, within the tunica vaginalis testis cheesy degeneration may take place, which sometimes breaks down into pus and remains for years without producing any disturbance.

Treatment of Pelvic Cellulitis.—At the first indication of a chill the patient must be put into bed, and every effort made to bring about a reaction. The continued application of heat must be made to the feet, as they will invariably be found cold. A warm drink will be of benefit, to which some stimulant may be added if needed, and a large hot flaxseed poultice should be placed over the abdomen. With reaction and pain, ten or fifteen grains of Dover's powder may be given, and, at the same time, a hot-water vaginal injection. When the patient is placed on a bed-pan for this purpose, her position must be made as comfortable as possible by the use of an extra pillow, of a proper size, under her back.

This injection should be continued literally *for hours*, if possible, and be repeated at short intervals. It is the only means we possess for aborting an attack of cellulitis, which *it will do, if thoroughly employed at the beginning.* The patient will be fully compensated for the temporary inconvenience and annoyance, since this treatment may prove the means of saving her, in all probability, many months of suffering.

While receiving the injection it is, therefore, necessary that the position of the patient should be a comfortable one, and the greatest care must be observed in protecting her from exposure to cold. Unless the nozzle of the injection pipe be made of horn, or some other non-conductor of heat, it will be necessary to cover it with a piece of India-rubber tubing. This is essential, for the patient will be annoyed exceedingly by the heat of a metallic nozzle between the labia, even at a temperature for the water far below what could be well borne if introduced through a pipe of non-conducting material. A Davidson's syringe, or some other instrument on the same principle, must be employed in preference to a fountain syringe. This is not an unimportant detail, for, if the experiment be made by any one of ordinary powers of observation he will be convinced that the impulse of the jet of water is needed to excite the proper contraction of the vessels. A piece of rubber tubing can be attached to the bed-pan, so as to carry off the overflow of water to some receptacle under the bed. This can be emptied from time to time without disturbing the patient. The water must be injected slowly, but in a steady stream, and at as elevated a temperature as can be borne with comfort. The hands of any one person will soon become cramped, in continuously squeezing the ball of the syringe, so that it will be necessary to have the assistance of another.

The best rule is to continue the injection until reaction has fully taken place, by which time the fever will have subsided, and a free action of the skin will have been established. Whenever it is possible to prolong this action of the skin by the use of the liquor ammoniæ acetatis, or by any other remedy, it should be done. Nothing would be better than a Russian bath, if it were available without involving the risks of exposure, and without entailing additional pain from the movements which would be necessary. The use of the hot water is usually very grateful, and, as it evaporates under the bedclothing, the action of the skin is thereby much increased.

The continued action of the hot water is to stimulate the circulation in the pelvis, so that the local congestion may be relieved, before nature attempts to do so by the exudation of serum into the surrounding tissues. With this view, it will be seen that an increased action of the skin must be most beneficial, and should be kept up as long as possible.

Another remedy to be employed for relieving the congestion is opium, which, for its local effect, is best given in the form of an injection into the rectum. At all hazards, the local irritation, as expressed by pain, must be quieted, or the current of blood will continue to flow towards the congested part. Unfortunately, there is but a very short time at the beginning, when it will be possible to abort the attack, and in a few hours the storm will have inflicted much damage.

The next stage will be a critical one, and will test to the utmost the recuperative powers possessed by the individual. Nature will now make the effort to repair, by aid of the absorbents, the damage done, and will rapidly accomplish the task if the progress of the inflammation can be arrested.

This stage is one of uncertain duration, lasting from a few hours to days, and is, as a rule, the one first seen by the physician, although not always recognized. The tissues have become infiltrated with serum, a local elevation of temperature exists in the vagina, the uterus may be movable, and, if the peritoneum has become involved, the inflammation is yet circumscribed, and no lymph has been thrown out. There will have been already a great mitigation in the degree of pain, and there may be even an absence of fever.

Rest in the recumbent posture is absolutely called for, the body must be protected from cold by an extra amount of flannel, and the extremities kept at a comfortable temperature by artificial means. If there is pain on pressure, it is the usual recommendation to apply a number of leeches to the abdominal wall over the seat of pain. Some temporary relief at least is frequently gained by this practice, but it is not to be followed, unless under some special circumstance. As the restoration to health depends on the patient's strength, this must not be impaired by the abstraction of blood, of which the benefit may be only temporary. Counter-irritation is of great service, and a marked improvement will be frequently noticed after the application of a blister. It is to be applied over the seat of pain, but with the precaution to avoid the groin, or the patient will be subjected to much unnecessary suffering. By using a mustard plaster at first to redden the skin, a more certain result will be obtained from the blister. When the material is good, six to eight hours should be sufficient for the blister to remain. It may then be removed, and the surface covered by a soft poultice protected on the outside by a piece of oil-silk. Then the whole may be secured by a light flannel binder, which should be worn as a protector whenever the abdomen is not covered by a large poultice. The poultice may be removed after a few hours as it becomes cool, and the several blebs formed by the blister are to be cut to allow the fluid to escape. After they have been emptied, the whole surface, which had been covered by the poultice, must be quickly wiped off with a soft sponge dipped into warm water, and with a little soap. Over this surface, when dried, is to be placed some loose cotton of the best quality. As it is a great object to husband the strength of the patient, it is necessary to heal the blister, and with as little discharge as possible. Nothing will do this sooner than cotton, which should be allowed to stick to the raw surface, and remain undisturbed until it falls off after the surface beneath has become healed. After a day or two all the cotton which can be removed without force can be taken away, and the rest must be softened somewhat by the application of a sponge moistened with warm water and a little carbolic acid. Then the surface must be dried with a soft towel, and again covered loosely with fresh cotton. This must be repeated daily, if any odor can be detected, or if the patient should complain of its being uncomfortable. A blister can thus be applied every twelve or fourteen days until the necessity no longer exists for its use.

The iodide of potassium is frequently used as an alterative in this condition, but it is not always reliable. I have seen the condition of a patient improve rapidly while taking it, and again I have seen not the slightest good result from its use. The same observation may be applied with equal force to the use of small and frequent doses of calomel. There are certain conditions where each of these agents seems to be efficacious, but with our present knowledge their use is somewhat empirical.

We must employ every means calculated to improve the general health. Tonics may be needed, but the use of iron in any form should be avoided if possible, on account of its constipating effect. To regulate the bowels during the later stages of cellulitis will prove a problem very difficult of solution. The food should be given in the most concentrated form, and the selection made so that the greater part will be assimilated, leaving but little residue to accumulate. It is all-essential to prevent an accumulation in the bowels, since this condition, by acting mechanically, must obstruct the return circulation from the pelvis. On the other hand, much distress and increase of pain are caused by any distension of that portion of the rectum partially constricted by the cellulitis. It is necessary to have the contents of the bowels in a semi-fluid condition, since the patient is either unable to strain, or instinctively avoids doing so, through fear of causing pain. It is essential to keep the rectum empty, for the pressure of any fecal mass will add greatly to her discomfort. The difficulty of managing these cases is greatly increased by the fact that few are able to tolerate a rectal enema, except in so small a bulk as to be of but little service. Any distension of the rectum, even in this way by fluid, must necessarily make pressure on the inflamed tissues. Scybalæ will frequently form notwithstanding all care, and, when in the rectum, the patient is generally unable to effect their expulsion. I instruct my nurses to introduce a finger, well oiled, into the rectum to remove any accumulation there may be, as soon as the patient begins to realize any discomfort. This requires some little expertness, for any approach to violence will produce much unnecessary suffering. The operation, therefore, is well worthy of the physician's personal attention, even if he has to administer the relief himself. A few ounces of warm flaxseed tea, or oil, may be thrown into the rectum, and then any hardened mass can be the more readily removed. The index finger is to be gently passed in front and beyond the mass, so that the necessary force for the removal can be exerted downwards and backwards towards the sacrum, and thus avoid pressure against the seat of inflammation. Sulphur in combination with the bitartrate of potassa answers well, as does an occasional dose of castor oil. I have had women under my care who were fortunately able to take every night a spoonful of castor oil which regulated the bowels perfectly without causing any disturbance of the digestion. Occasionally, it is good practice to give a pill containing five grains of inspissated ox-gall three times a day, and if there be any flatulence, four grains of assafœtida in a sugar-coated pill, may be added, provided it can be taken without disturbance to the stomach. Our first care must be to spare this organ, and we must never lose sight of this necessity. From reflex action, the stomach would naturally be liable to derangement through sympathy with the pelvic condition. The necessity is, therefore, the greater to aid digestion by judicious means, and to avoid over-taxing the stomach. In other words, we must have it at rest, as far as posssible, when not necessarily engaged in digestion, for, as soon as nutrition becomes impaired through failure of the digestive powers, recuperation ceases.

Whenever a patient is able to take cod-liver oil without deranging the digestion, it will prove a most fortunate circumstance, as this remedy is very effective in repairing the waste.

Of all the diseases and complications we may be called on to treat in this branch of surgery, we will find none in which sunlight and fresh air prove so beneficial and essential as in pelvic abscess. Unless it be during the mildest season of the year, a patient suffering from this disease will tolerate but little exposure, from being so sensitive to the effects of cold. She should occupy a bright, sunny room, and, as far as possible, she should carry out the suggestions I have already given on this subject.

The vaginal injections of hot water are to be continued throughout the progress of the case, and are best administered early in the morning and at night. A large basinful will answer every purpose, for the time has now passed when the continued use of this agent can be beneficial as a prophylactic. But it may indirectly stimulate the absorbents and diminish somewhat the pelvic circulation, and soothe the general system by temporarily relieving the local irritation. It thus gives great comfort, and is most useful in inducing sleep, when employed as the last thing after the patient has been prepared for the night.

A judicious use of opium and anodynes generally will require a discriminating exercise of judgment on the part of the physician. These remedies are to be held in reserve for a last resort, as the sheet anchor to the threatened wreck. There is a period always to this disease, if it becomes general, when an opiate furnishes almost the only hold on life. It is then the only effective agent left, and acts as a tonic, by allaying pain, affording rest, and checking the waste to the nervous system. I am certain that I have seen cases where recovery was due alone to the anodynes having been held in reserve. The common practice is to get the patient so dependent on their use in the early stages of the disease, that when most needed, their good effects are not obtained, such large doses becoming necessary, that the appetite and the digestion are impaired by their use. It would be a bad plan ever to allow the patient to actually suffer from pain, but there are times when the hot-water injections or some other mild means would answer. But when an opiate is necessary, as I have already recommended, let it be always administered either by injection or by a suppository in the rectum, and let its use thus be made as little a matter of routine as possible. Of all modes, that by the hypodermic syringe is the most dangerous, since it can be so readily employed. The inventor of this method has given, I fear, a curse to the human race instead of a blessing. I may be deemed prejudiced, but I have long felt that the medical profession is largely responsible in the abuse of this instrument, for the widespread existence of the opium habit. This vice is increasing so rapidly all over the country, that we shall, to our sorrow, at no distant day, rival the Chinese in the consumption of this drug.

For convenience of description, we may make a third stage in this disease, that of exudation. But, in practice, the stage of infiltration, if not arrested by convalescence, passes so rapidly into that of exudation that the two stages may be regarded as one, the same course of treatment being applicable.

Then, in turn, if the stage of exudation and its progress be not arrested and followed by recovery, we must expect the most serious condition, that of the formation of pus. This is ushered in by the occurrence of rigors from time to time, followed by fever and with increase of pain. The pus formed by the disintegration of tissue is at first scattered about in small masses which in time break down the intervening tissues and form one or more abscesses. These abscesses sometimes promptly find an outlet, convalescence begins at once, and the sac rapidly disappears. But, with many, the cavity remains open for an indefinite period, its lining membrane forming a pus-secreting surface. The danger to the patient is now greater than at any other stage of this disease. In addition to the great draft made on the system by the profuse discharge of pus, the patient, in all likelihood, begins to suffer hectic or irritative fever and blood poisoning. So long as the pus remains sacculated, the latter danger is slight, but, after the abscess has been emptied of its contents, nature makes an effort to remove the difficulty by absorption. So in the progress of the last stage of this disease the system is being constantly poisoned, and as long as sufficient strength remains, the poison will be eliminated.

Quinia, opium, and the most nutritious diet will be now the chief means for sustaining the patient. There will scarcely ever be more than a remission of fever in this stage, but by watching the temperature as it varies in the vagina it will be seen that there is almost always an increase of fever between noon and midnight. This condition and the tendency to blood poisoning must be kept in check by the use of quinia in large doses, which, it is well known, possesses the property of lessening the frequency of the pulse and lowering the temperature. Quinia is said to possess the further property of limiting the migration of white corpuscles and the formation of pus, which, if it is true, gives it additional value in this disease. From recent observations, it is claimed that with double the quantity of the bromide of potassium, or with hydrobromic acid, quinine may be given in large doses without the occurrence of quinism, and without impairing its own properties. My experience has yet been limited, but so far as it goes it is favorable to the combination. We have another resource of value in the careful use of aconite, as the vital powers become impaired, and the action of the heart is necessarily rendered more frequent from a diminution of its force. It is to be employed for its tonic effect on the heart itself, by which the organ will be better able to do its work. Under the influence of this remedy the heart will be able to expel the same quantity of blood by a fewer number of contractions than before, when the increase of frequency was due to an enfeebled condition, and not to increased force. As soon as the number of contractions of the heart has been reduced twenty beats in the minute, it is safer to lessen somewhat the dose and watch its effects. While under the effects of aconite, it is even the more important that the patient should be nourished with regularity and care. Moderate doses of stimulants, if needed, may be used, since they will also lessen the frequency of the pulse, and materially aid the action of the aconite.

Very few of the thermometers sold by the instrument-makers are reliable. They are not fit for use until at least a year after they have been made, since the tubes contract, and the scales, if adjusted too soon, give erroneous indications. They should never be graduated until all shrinkage in the glass has ceased. I have noted a difference of as much as three degrees between two instruments from the same maker.

An elevation of two or three degrees above the natural temperature of the body is of but little moment in an attack of cellulitis. But if a reliable instrument registers the temperature at 105°, the condition is a very serious one, and but few recover if the temperature remains above this point for any length of time. The higher the range of temperature the more certain will it be an indication of the peritoneum being involved and of the extension of the inflammation.

The rule is as applicable here as in general surgery, to open freely a collection of pus as soon as it can be detected. I do not regard it as sound practice to wait until the pus finds an outlet for itself. There is no possible way by which the contents of an abscess could be disposed of except by rupture. It is, therefore, the safest procedure to open the abscess through the vagina as soon as the presence of the pus can be detected. This, however, is sometimes very uncertain unless the walls are thin, for the sensation of fluctuation may be well marked and yet no collection of fluid be found. But, when we are sure of the existence of the abscess, there can be nothing gained by allowing its contents to burrow to a greater extent through the tissues, with the possibility of escape into the peritoneal cavity. Whether the abscess has ruptured into the vagina, or been evacuated artificially, the opening must be sufficient to admit of the cavity being thoroughly washed out. I employ warm water with a little impure carbolic acid or an injection of warm water through which a few spoonfuls of brewer's yeast have been diffused. The irritative fever will lessen as the cavity contracts, and its lining membrane brought into a more healthy condition so that the discharge from it becomes greatly diminished. The opening should be at the most dependent portion, if possible, although this cannot always be a matter of selection, but is a fortunate circumstance when it happens, because thereby the cavity more easily contracts from being properly drained. With a free opening, admitting the ready access of air, the discharge will increase for a time and become more offensive, but this can be greatly lessened by washing out the cavity. The vaginal injections are to be continued, and may be given by the nurse as a means of keeping the canal free from decomposing pus. But the washing out of the tract of the abscess should never be devolved by the surgeon upon an assistant. The operation requires judgment, and the water should be thrown from a long nozzle glass syringe, without force, and with care. This is a necessary precaution, since I have known of two instances where the sac was ruptured and death ensued from the contents passing into the abdominal cavity. This danger is a temporary one at the beginning, for nature will soon form some adhesion or thickening at any weak point after which this accident cannot occur. The nozzle of the syringe must be turned in different directions so as to wash off the sides of the cavity, and the injection is to be continued until the water comes away clear. After I have continued to wash out a cavity for some time, and the condition of the patient may have ceased to improve, I inject a weak solution of iodine and water. If no particular disturbance be caused, I increase its strength in a few days, and watch the effect. The object is to destroy the pyogenic surface by a solution strong enough to effect the purpose, without lighting up a fresh attack of cellulitis.

A pelvic abscess does not often empty into the rectum alone, but frequently it does into both the rectum and vagina in the same case. An additional opening into the rectum complicates the case very much, and the result is never so favorable as when the opening is only into the vagina. With an opening into the rectum the discharge is always more profuse from the presence of fecal matter, or, if the opening is so situated that the passage of feces does not take place through it, the escape of flatus will prove almost as irritating. Unless the tract of the abscess can be washed out from the vagina, we will be obliged to rely chiefly on the endurance of the patient for recovery.

I have met with but a single instance of an abscess forming in the cellular tissue between the uterus, bladder, and vagina. The case came under my care a year or more after the abscess had ruptured into the bladder, and in consequence of the escape of urine through the vaginal canal. Through an opening located in the median line, and in the centre of the vesico-vaginal septum, a probe passed back along a sinus to the uterus, but did not enter the bladder. With a pair of blunt-pointed scissors, I laid open the tract until I reached the small cavity which had been the seat of the abscess, and through a thin anterior wall a small opening was found passing directly into the bladder. The sides of this cavity were carefully freshened by means of a pair of scissors, and when too thin were scraped, so as to obtain a denuded surface. Interrupted sutures were then introduced and the sides of the cavity brought together in the median line.

Two instances of cellulitis have passed under my observation, in which the urine escaped directly into the vagina from the left ureter. In one case the ureter seemed to have formed an adhesion to the vaginal wall just behind the junction of the posterior cul-de-sac with the cervix. The contents of the abscess emptied into the bladder, while the pressure of the accumulation and the pus produced so much irritation that the passage of urine from this ureter into the bladder became obstructed, and forced its way into the vagina.

In another case the left ureter was cut across by the surgeon, at precisely the same point, in opening the abscess, so that both pus and urine passed into the vagina. These two cases will be again referred to, more in detail, under the head of vesico-vaginal fistula.

The natural position of this portion of the ureter is outside of the bladder, and in these two cases was fully an inch above its vesical orifice. The displacement must have been brought about by the weight and downward pressure of the abscess, and it would, therefore, be well in opening an abscess from the vagina to avoid, if possible, this locality.

Dr. Brickell, of New Orleans, has recently made an important contribution[1] to this subject, and his views are summed up by himself as follows:—

"Conclusions: 1. I have no doubt at all that there are two distinct forms of pelvic inflammation—serous and phlegmonous, or suppurative. An attack of either may be abortive—that is, may fail to result in formation of pus or effusion of serum. But, should either pus or serum be formed, then

2. I am sure that evacuation is the proper practice; and

3. Either should be evacuated per vaginam.

4. The presence of pus in any portion of the body is not to be tolerated by the surgeon. I contend that the presence of effused serum in the pelvis is not to be tolerated either. As long as it is present, in addition to the pain and prostration, there is the abiding stimulus to repeated inflammation, and the pelvis can and will be ravaged.

5. Topical applications and internal remedies have no influence on pelvic serous effusion, according to my observation."

Not being in general practice, I have seen but few cases before the abscess had already ruptured. In my own practice I have also been so fortunate as to have had a very limited experience. Necessarily, many cases of cellulitis have occurred in my hands during the course of treatment or after operations. But during sixteen years' service in the Woman's Hospital I cannot recall a single instance where the inflammation terminated in an abscess. During the same time, in my private practice, I have had two cases occurring after division of the cervix, which I have referred to when treating of this operation. In fact I have never had the opportunity of opening more than five or six pelvic abscesses in my life, and I have never met with a collection of serum, as described by Dr. Brickell. In post-mortem examinations of inflammatory conditions resulting from childbirth, I have so frequently found the connective tissue infiltrated with serum, that I have always regarded its presence as indicative of a stage of the cellulitis, which would naturally terminate in a pelvic abscess if not arrested. Dr. Brickell reports a number of cases relieved by evacuating accumulations of serum equal in quantity to the contents of an abscess. I can recall a number of cases which have been under my observation with thickened tissues, where no treatment seemed to have had the slightest effect, and finally they have passed into other hands. It is quite probable that among this class of cases will be found these collections of serum, since Dr. Brickell does not seem to have met with an instance where such an accumulation has found an outlet without the aid of the knife. He cites a case of a collection of pus producing no irritation for a length of time after the acute symptoms had vanished, and it is of particular interest in connection with the history of the case of supposed fibroid recently given. Dr. Brickell writes: "Suppuration, Case IV., cited by me, shows clearly how free deposits of pus can take place in the pelvis as results of acute attacks of inflammation, and yet, when the acute symptoms subside, the patient may get up, improve in appearance, and even work for a living for several years in comparative comfort. After a while, however, active inflammation is relighted, and the result will be destruction." This is not the rule, however, with collections of pus, while there are other cases, as I have stated, which are at a standstill for years. In these cases I hope we may find this accumulation of serum, and if they can be relieved by means of the aspirator, Dr. Brickell will have indeed done good service. But experience alone can determine the proper time for making this exploration, for I cannot regard the introduction of the trocar into the inflamed tissues of the pelvis as a procedure free from danger under all circumstances. These remarks are prompted by the recollection of two cases where, having erred in my diagnosis, and getting no fluid on the introduction of the trocar, the patients' lives were seriously jeopardized by the fresh attack of cellulitis which resulted.

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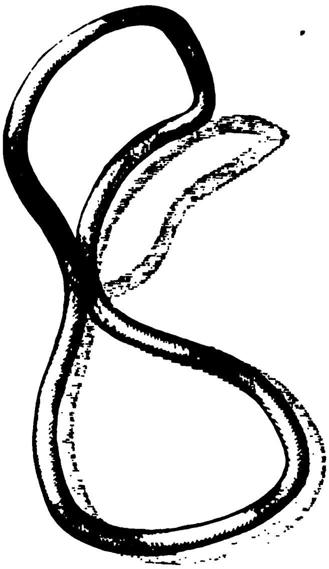
[1] The Proper Treatment of Pelvic Effusions. By D. Warren Brickell, M.D., Professor of Obstetrics, etc., Charity Hospital Medical College, New Orleans. American Journal of the Medical Sciences, Philadelphia, April, 1877.

Before closing this subject, I will direct the attention of the reader to a condition which does not seem to have been described by any other observer. After an attack of cellulitis has subsided the tissues which had been inflamed contract. When the inflammation has occurred in one of the broad ligaments, the neck of the uterus will be drawn towards the injured side in consequence of this ligament becoming shortened. The uterus under these circumstances will frequently became enlarged, and it will often be a matter of surprise to find, after a reasonable time, that there has been no improvement in the condition of the uterus, even under the most approved course of treatment. The woman will become an invalid from her inability to exercise, and after awhile another attack of cellulitis may come on without any apparent cause. If a weight were hung by two or more cords of equal length, and one of them be wetted, that one to which the moisture was applied would shorten so much that the whole weight would become suspended from it. And so the weight of the uterus and its appendages will have to be sustained by the ligament or part which has been inflamed and shortened. The consequence will be a state of congestive irritability, which will not only neutralize all remedial efforts, but sooner or later will induce an attack of cellulitis in the opposite healthy ligament, as a result of the constant one-sided traction. If we gently lift the uterus to a given point, on the extremity of the finger, we will generally find, as I have already said in the early part of this work, that the patient will experience the greatest relief and the pulsation of the vessels will gradually cease.

Fig. 48.



Pessary for cellulitis.

The first step to be made towards a restoration to health is to lift and maintain the uterus at a plane in the pelvis at which this traction will be entirely removed. This is to be accomplished by a pessary curved enough to lift the organ and at the same time moulded in such a manner as not to press laterally upon the seat of inflammation or the thickened ligament. I have frequently employed, for this purpose, an instrument formed from an ordinary lever pessary by twisting it on itself, so that one end may stand at a right angle to the other. The front half of the pessary remains unchanged, but the part which would rest under the inflamed broad ligament is bent over to the opposite side, so as to support the uterus under the healthy broad ligament, and along half of the posterior cul-de-sac, the seat of the old inflammation not being touched by the instrument. (See Fig. 48.)

CHAPTER XIV.

DISPLACEMENTS OF THE UTERUS.

Anatomical supports of the uterus—Normal position of the uterus—Pelvic roof—Downward displacements, or prolapse—Causes—Versions; forward, backward, lateral—Causes of versions—Flexures.

THE uterus receives its support from the utero-sacral ligaments behind, the broad ligaments on either side, the round ligaments in front, and from the connective tissue of the pelvis.

As the peritoneum dips down between the organs and over the Fallopian tubes, it includes a certain amount of the cellular, or connective, tissue between its folds, which, with a few muscular fibres, form the uterine ligaments. These ligaments, with the exception of those from the uterus to the sacrum, offer but little resistance to any downward pressure or prolapse, and are but as guys to steady the organ in resisting a tendency to version. The action of these ligaments is aided by the folds of the vagina about the cervix, which acts as a lever to maintain the axis of the uterine canal in its natural relation to the vaginal axis.

We are indebted to Dr. Henry Savage for the demonstration of the structures which really support the uterus and oppose its displacement. To illustrate his views, Figs. 48 and 49 have been copied from Plate IX. of his work,[1] with the accompanying description. Fig. 48 represents a "horizontal section of the abdomen on a level with the upper edge of the ilium on each side. The uterus, drawn down through the vagina by means of a vulsellum attached to its neck. Moderate traction, as much as possible in the direction the uterus would take in the early stage of ordinary prolapsus, was continued until it seemed to threaten some physical damage to the structures now more strongly opposing its further descent. The parts concerned, exposed to view as shown in the figure, assumed the following relative bearing:—

B, bladder, depressed and compressed towards the pelvis by U, uterus, which has descended about an inch and a half. C, utero-sacral ligaments, having lost their natural curve round the forepart of the rectum, diverge, and become straight from being forcibly stretched between their attachments. O, alar mesentery and contents pulled forward and slightly depressed. L, round ligament curved around (but not on the stretch) in following its uterine attachments. *g*, ureter. *s*, spermatic vessels somewhat more prominent under their peritoneal covering. No sign of strain whatever, on either the broad or round ligaments. The utero-sacral ligaments having been divided transversely, the uterus yielded rather suddenly about another inch. Before examining the new obstacle which now prevented its further progress, the pelvis was divided perpendicularly and from before backward."

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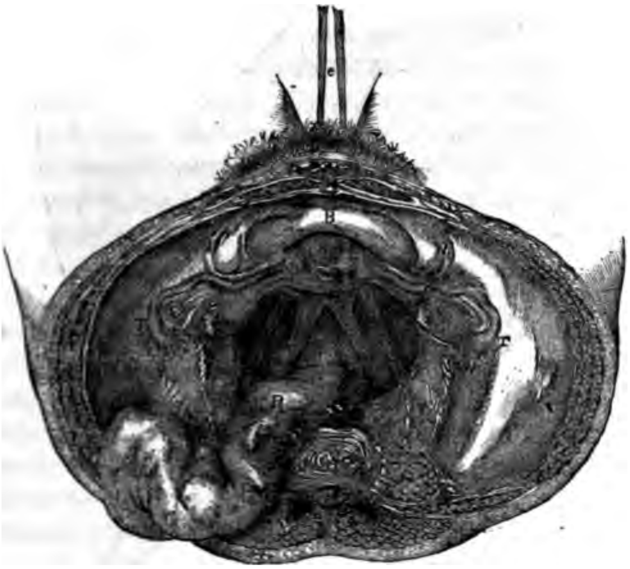
[1] Illustrations of the Surgery of the Female Pelvic Organs, by Henry Savage, M.D , etc., London, MDCCCLXIII.

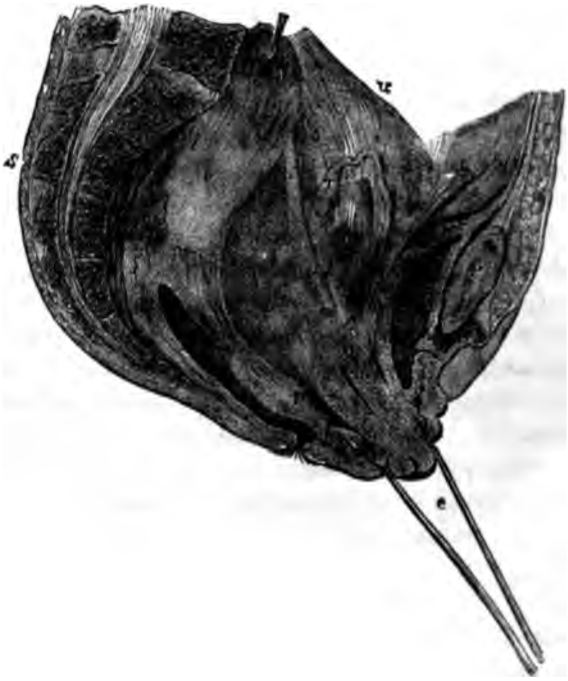
Fig. 49.



Transverse section of the pelvis. (Uterus drawn down.)

Figure 50 represents the "left half of the pelvis, and corresponding half section of B, bladder; U, uterus; and R, rectum; P, pubic symphysis; O, ovary; F, Fallopian tube; L, round ligament. The three latter are still in their natural relations with the broad ligament, which is seen on the stretch, pulling strongly on the margin of the pelvis. The bladder is drawn down with the uterus, owing to the intimate connection between the two. The rectum is not disturbed, the anterior layer of its sub-peritoneal cellular sheath, P, retains a much weaker hold of the vagina than existed in the case of the bladder, vagina, and uterus. The uterus is seen half out of the vulva, retained only by the broad ligament, which, when divided or stretched sufficiently, removes the last obstruction to complete prolapsus of the organ. After the uterus came down a further inch, as the result of dividing the utero-sacral ligaments, some retaining agent, other than the broad ligaments, still prevented its arrival at this last stage, as above described. The obstruction was found to be due to the subperitoneal pelvic cellular tissue, particularly where it surrounds and accompanies the uterine bloodvessels. This tissue is here strengthened by additional trabecular filaments, so disposed as to support the vessels and defend them from the effect of sudden strain incidental to the various movements of the body, more especially in cases of uterine enlargement. Complete prolapse was effected only after yielding of the pelvic reflections of the broad ligament. This occurred from behind forwards, the round ligaments being the last put on the stretch. U, outline of position of uterus before the commencement of the experiment."

Fig. 50.



Left half of pelvis. (Uterus drawn down.)

The pelvic roof is thus described by Savage: "A plane passing horizontally backwards from just below the sub-pubic ligament to the attachment of the utero-sacral ligaments at the sacrum, would indicate the level where the utero-vesical peritoneal reflections pass from the pelvic organs to the pelvic wall. The upper wall of the vagina is firmly adherent to the base of the bladder (vesico-vaginal septum), and to the whole of the forepart of the uterine cervix. It follows a slightly curved line from the vestibule to the uterus, and through the utero-sacral ligaments it is attached to the sacrum. When these structures are intact, they constitute an important line of mutual support for the vagina, uterus, and bladder (pelvic roof)."

It is impossible to establish a point which can be accepted as the normal position of the uterus in health. This difficulty arises from the fact that each woman has her own individual standard, from which, however, some deviations will frequently occur without being necessarily the result of disease. The uterus will change its position in health with every movement of the diaphragm, and will be also influenced by the condition of the bladder, by constipation, mode of dress, and by any temporary obstruction to the pelvic circulation. The existence of even a marked deviation is often of little moment in itself. A malposition, however, may sometimes render the woman more liable to suffer from some accidental complication from which she might otherwise escape, were the uterus in position. But, until the circulation of the uterus becomes obstructed from accident, and this condition is superadded to the displacement, she may remain long in ignorance of her condition.

THE UTERUS MAY BE DISPLACED DOWNWARD, TO EITHER SIDE, OR IN THE UPWARD DIRECTION.

The downward displacement, or prolapse, is in proportion to, and occurs from, any increased weight in the organ itself, or in consequence of its being crowded lower into the pelvis by some growth above. In a simple prolapse, there may be no deviation in the uterine axis until the floor of the pelvis has been reached, but any descent beyond this point towards the vaginal outlet is always accompanied by a proportionate version of the fundus into the hollow of the sacrum.

When the uterus has been crowded from the vaginal outlet, in consequence of increased weight or from pressure above, the progress in the displacement will have been similar to that demonstrated by Dr. Savage. But the same result or a condition of procidentia takes place more frequently from a want of proper support at the vaginal outlet, so that the process, as described by Savage, is reversed. Whenever the perineum has been extensively ruptured after childbirth, a fold of the posterior wall, or recto-vaginal septum, soon presents at the outlet of the vagina. From the direction of the rectum and the curve in its course, by which the force is expended on the weakened septum, this prolapse must be increased by every effort at stool. In consequence of this condition, and from a want of proper support, when the woman is in the upright position, the whole posterior wall of the vagina becomes gradually involved. The utero-sacral ligaments at length yield, the uterus prolapses and becomes retroverted, the anterior wall of the vagina is dragged down from before backward and turns under the arch of the pubis, and the procidentia becomes complete.

VERSIONS OF THE UTERUS TAKE PLACE IN THE FORWARD DIRECTION, BACKWARD AND TO EITHER SIDE.

Some degree of forward displacement, or *anteversion*, may be accepted as a normal position. In fœtal life, during childhood, and after puberty in the healthy female who has not borne children, it will be found an exception to the rule whenever the uterus occupies any other position than one of moderate anteversion.

Retroversion is the most common form of uterine displacement, and is not at all rare.

Lateral versions are rare, seldom congenital, and ordinarily result from shortening of the broad ligament after an attack of cellulitis.

Versions of the uterus may, in general terms, be attributed to imperfect development and to mechanical causes. The instances resulting from imperfect development are comparatively rare. A version may occasionally result from a defect in the length of one of the uterine ligaments by which the organ is drawn towards the shortened side. But practically almost the only displacement which can be attributed to a defect is that due to a want of development in the shape and size of the vagina. In such an instance, the vagina terminates around a cervix of unusual length, without forming a posterior cul-de-sac. The consequence is, that the neck of the uterus, being too long, is necessarily crowded forward in the vagina, in the direction offering the least resistance, and retroversion follows. This result may be considered a mechanical one, from a congenital cause or defect.

The mechanical causes of version are easily recognized and are brought into play by the aid of gravity. As an instance, the growth of a fibroid may be cited, or an unequal increase on one side of the uterus, from some local obstruction to the circulation, by which the organ would naturally be tilted to the heaviest side.

From versions we naturally pass to the consideration of flexures, which are, with a single exception, but exaggerated forms of the original displacement, and a result of some local obstruction in the circulation of the uterus itself, or in the surrounding tissues.

FLEXURES ARE FORMED IN THE CERVIX AND BODY OF THE UTERUS.

Those in the cervix, it is thought, have their origin about the age of puberty from faulty nutrition. This form of flexure occurs at or just below the vaginal junction, in consequence of an undue length of development in the cervix, a condition to which reference has already been made. The diameter, or rather the resisting power, of the cervix will generally determine the form of flexure. Since the size of the cervix is so out of proportion to the capacity of the vagina, it must either become bent on itself, thus forming a flexure, or the neck must rest in the axis of the vagina, which will throw the fundus of the uterus into the hollow of the sacrum. When the cervix becomes thus bent on itself, the body of the uterus will remain in position, or be somewhat anteverted. But the cervix becomes ultimately more elongated and snout-shaped, from being crowded forward towards the vaginal outlet. If the neck remains in the axis of the vagina, and the uterus becomes retroverted, sooner or later, difficulty must arise from its position, since it is one likely to be increased by constipation or over-exertion. As an inevitable consequence of extreme retroversion, the circulation in the uterus must become sufficiently impeded to greatly increase the size of the organ, and thus add to the difficulty. The additional provocation, as an exciting cause of irritation, is generally sufficient to cause cellulitis in the neighborhood, with the effect of still more increasing the congestion and size of the uterus. In proportion to the descent of the fundus into the hollow of the sacrum, the cervix will be pressed upward against the anterior wall of the vagina, and be bent upon itself at or below the vaginal junction. This is the commonest form of retroflexion (see Fig. 51), although occasion-

Fig. 51.

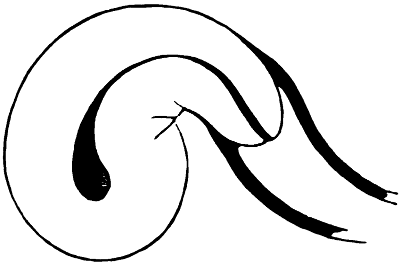


Diagram of a flexure of the cervix.

ally we find in addition a flexure of the body of the uterus above. A flexure of the body alone is rarely found until the case has been of long standing and atrophy of the cervix has taken place, from obstruction to the circulation, and that of the body has already begun. Frequently the flexure in the cervix is not recognized, and the observer is misled by the increased thickening on the posterior wall of the uterus, which gives the impression to the finger as if the uterine body was flexed upon itself at that point.

Until the treatment comes to be considered we will not describe the other forms of flexures found in the uterine body, since what has already been stated in regard to versions is equally applicable to the corresponding flexures.

CHAPTER XV.

ETIOLOGY AND TREATMENT OF UTERINE VERSIONS.

Tables XVIII. to XXIII. inclusive, showing the relations of versions to menstruation, marriage, celibacy, fruitfulness, sterility, pregnancy, age, pain, etc., also percentages—Treatment of versions.

It is difficult to determine the class of cases which should be grouped together for the study of these displacements. There were eight hundred and four cases of versions, or 32.85 per cent. of the total number of women under observation. This number includes all displacements from whatever cause; whether from impairment of nutrition or actual disease of the uterus itself—and these may be called original versions—or from the existence of disease in the neighboring parts—which versions may be termed secondary. Of original versions there were five hundred and fifty-five cases, being 26.76 per cent. of the total number of women under observation, and our consideration shall be limited to these.

The numbers and percentage of each displacement are shown in Table XVIII., for the unmarried, sterile, and fruitful women, the last class being again subdivided into women who had never miscarried, those who had borne children to full term but also miscarried, and those who had miscarried and never gone to full term.

The number who menstruated for the first time, between the extreme ages of ten and twenty, are also given, with the average age at puberty for each class, and the average age at marriage.

These tables are given as part of the history of displacements, but, however useful they are, we cannot accept deductions from them as conclusive, until confirmed by more extended observations. They seem to indicate that sterile women menstruate for the first time later in life than any other class; and that fruiful women who miscarry begin to menstruate later than those who go to full term. For it is shown that those who always miscarried approached nearer than any other the averages of the first menstrual age of the sterile. Those who habitually miscarried show also a larger proportion of retroversions than those who have borne children to full term. On the other hand, it will be seen that childbearing seems to increase greatly the propor-

TABLE XXIII. *Versions of the Uterus.*

		Age at first menstruation	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	Summary						
														Forward.	Backward.	To the right.	To the left.	Total.	[illegible]	[illegible]
Unmarried.	Versions of the uterus.	Forward	....	....	6	5	10	7	5	1	....	....	....	34	....	....	....	....	14.04	
		Backward	....	4	2	12	16	10	5	4	2	....	....	....	55	....	....	....	14.21	
		To the right	....	....	....	....	....	1	....	1	....	....	....	....	....	2	....	....	16.00	
		To the left	....	1	....	1	1	....	....	....	....	....	....	....	....	....	3	....	12.66	
		Total	....	5	8	18	27	18	10	6	2	....	....	....	....	....	....	94	14.15	
		Percentage	....	5.31	8.51	19.14	28.72	19.14	10.63	6.38	2.12	....	....	36.17	58.51	2.12	3.10			
Sterile.	Versions of the uterus.	Forward	1	2	7	14	16	11	4	1	1	....	....	57	....	....	....	....	13.76	21.47
		Backward	....	1	12	19	24	9	11	7	1	3	....	....	87	....	....	....	14.51	22.55
		To the right	....	....	....	....	3	....	....	....	....	....	....	....	....	3	....	....	14.00	20.33
		To the left	....	....	....	3	1	2	2	1	....	....	....	....	....	....	9	....	14.66	21.55
		Total	1	3	19	36	44	22	17	9	2	3	....	....	....	....	....	156	14.25	22.05
		Percentage	.64	1.92	12.18	23.07	28.20	14.10	10.89	5.76	1.28	1.93	....	36.53	55.76	1.92	5.76			
Fruitful.	Versions of the uterus among those who had gone to full term and had never miscarried.	Forward	....	5	12	12	38	16	6	5	3	....	....	97	....	....	....	....	14.04	20.80
		Backward	....	3	17	20	17	22	9	2	3	....	....	....	93	....	....	....	13.94	20.32
		To the right	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
		To the left	....	....	....	2	1	....	....	....	....	....	....	....	....	....	3	....	13.33	29.33
		Total	....	8	29	34	56	38	15	7	6	....	....	....	....	....	....	193	13.98	20.70
		Percentage	....	4.14	15.02	17.61	29.01	19.69	7.77	3.62	3.11	....	....	50.25	48.18	....	1.55	....		
	Versions of the uterus among those who had gone to full term and had also miscarried.	Forward	....	1	8	4	4	9	8	3	1	....	....	38	....	....	....	....	14.65	19.68
		Backward	....	3	8	5	8	7	3	1	1	....	....	....	36	....	....	....	13.72	20.00
		To the right	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
		To the left	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
		Total	....	4	16	9	12	16	11	4	2	....	....	....	....	....	....	74	14.06	19.87
		Percentage	....	5.40	21.62	12.16	16.21	21.62	14.86	5.40	2.70	....	....	51.35	48.64	....	....	....		
	Versions of the uterus among those who had never gone to full term.	Forward	....	....	2	2	4	2	....	....	....	....	....	10	....	....	....	....	13.60	20.40
		Backward	1	1	4	3	5	3	2	4	1	....	....	....	24	....	....	....	14.20	22.87
		To the right	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	20.00	21.00
		To the left	....	....	....	1	....	....	2	....	....	....	....	....	....	....	3	....	15.00	22.33
		Total	1	1	6	6	9	5	4	4	1	....	1	....	....	....	....	38	14.26	[illegible]
		Percentage	2.63	2.63	15.78	15.78	23.68	13.16	10.52	10.52	2.63	....	2.63	26.31	63.15	2.63	7.89	....		
	Versions of the uterus among all women who had been pregnant.	Forward	....	6	22	18	46	27	14	8	4	....	....	145	....	....	....	....	14.10	20.48
		Backward	1	7	29	28	30	32	14	7	5	....	....	....	153	....	....	....	13.93	20.56
		To the right	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	20.00	21.00
		To the left	....	....	....	3	1	....	2	....	....	....	....	....	....	....	6	....	14.16	23.83
		Total	1	13	51	49	77	59	30	15	9	....	1	....	....	....	....	305	14.08	20.68
		Percentage	.32	4.25	16.71	16.06	25.24	19.34	9.83	4.91	2.95	....	.32	47.54	50.16	.32	1.96			

tion of anteversions. The number of lateral versions is too small to warrant definite conclusions concerning them.

Table XIX. presents a summary of all classes, as given in Table XVIII. If we accept the data furnished by Table III., page 156, as to the relative proportion of the unmarried, sterile, and fruitful, it will be seen by the table before us that neither class is more liable to suffer from versions than the other two. In the last column to the right of Table XIX. is given the proportion of each class of women who suffered from versions. By comparing these with the relative proportions, as given in Table III., it will be found that they are almost identical.

TABLE XIX.—*Frequency of Versions among the Unmarried, Sterile, and Fruitful.*

	Forward.	Percentage.	Backward.	Percentage.	To the right.	Percentage.	To the left.	Percentage.	Summary.			Percent. and total.
									Unmarried.	Sterile.	Fruitful.	
Unmarried....	34	36.17	53	58.51	2	2.12	3	3.19	94			
Percentage..	14.40	....	18.64	....	....	....	....	....	....	....	....	16.93
Sterile.........	57	36.53	87	55.76	3	1.92	9	5.76	....	156		
Percentage..	24.15	....	29.15	....	....	....	....	....	....	....	....	28.10
Fruitful.......	145	47.57	153	50.16	1	.32	6	1.96	....	....	305	
Percentage..	61.44	....	51.86	....	....	....	....	....	....	....	....	54.55
Total.........	236	....	295	....	6	....	18	....	....	....	....	555
Percentage..	....	42.52	....	53.15	....	1.08	....	3.24				

Table XX. is of interest in pointing out that there was no special indication given at puberty of the existence of disease among those women who, in after life, suffered from version.

Table III., page 156, which has been already referred to, gives also the proportion of women who were regular from the first, of those who became regular, and of those who were never regular. It also shows that a large proportion of women commence their menstrual life in good health, and the percentage (72.33) given is doubtless correct. By comparing Table XVI. and Table III. a remarkable coincidence may be noticed, the percentages for the several classes in Table XVI. being almost identical with those taken on the total number of all women under observation.

The percentages for retroversion differ slightly from the general percentages indicated in Table III., and show that of women who in after life suffered from retroversion a larger proportion were regular from the first, leaving a smaller number for those who became regular afterwards, or who were never regular. The deductions, therefore, to be drawn from these figures are greatly in favor of the supposition that retroversions, as a rule, have their origin at a later time in life.

The only point to be noted in regard to lateral versions is that the large proportion of those who suffered from them were sterile.

TABLE XX.—*Condition of Menstruation with Versions.*

	Condition of menstruation.	Unmarried.	Sterile.	Fruitful.	Total.
Anteversions.	Regular from the first	25	40	95	160
	Percentage	69.44	76.92	71.96	72.72
	Regular afterwards	5	8	23	36
	Percentage	13.88	15.38	17.42	16.36
	Never regular	6	4	14	24
	Percentage	16.66	7.69	10.60	10.90
	Total	36	52	132	220
	Percentage	16.36	23.63	60.00	
Retroversions.	Regular from the first	32	51	104	187
	Percentage	80.00	83.60	83.20	82.75
	Regular afterwards	4	7	14	25
	Percentage	10.00	11.47	11.20	11.06
	Never regular	4	3	7	14
	Percentage	10.00	4.91	5.60	6.19
	Total	40	61	125	226
	Percentage	17.69	26.99	55.31	
Lateral versions.	Regular from the first	1	8	2	11
	Percentage	100.00	80.00	40.00	68.75
	Regular afterwards	....	2	2	4
	Percentage	....	20.00	40.00	25.00
	Never regular	....	....	1	1
	Percentage	....	....	20.00	6.25
	Total	1	10	5	16
	Percentage	6.25	62.50	31.25	

It is shown by Table XXI. that of those who had anteversion and suffered from pain at the beginning of the flow, 75.86 per cent. were fruitful afterwards. The only explanation which can be offered in the present state of our knowledge, is in the supposition that flexure of the cervix at first existed. We shall see hereafter that pain at the

TABLE XXI.—*Versions of the Uterus in Connection with the Regularity, Pain, and Length of the Menstrual Flow.*

		MENSTRUATION REGULAR FROM THE FIRST.								REGULAR AFTERWARDS.							
		Single.		Sterile.		Fruitful.		Total.		Single.		Sterile.		Fruitful.		Total.	
		No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.
Anteversions.	With pain at the beginning of the flow	....	....	3	15.00	17	85.00	20	....	....	....	3	50.00	3	50.00	6	....
	Average length of flow (in days)	....	....	4.33	....	4.58	....	4.55	....	....	....	5.00	....	4.00	....	4.50	....
	With pain during the flow	7	30.42	11	60.87	2	8.69	23	....	3	37.50	3	37.50	2	25.00	8	....
	Average length of flow (in days)	5.14	....	5.57	....	6.00	....	4.87	....	3.66	....	5.00	....	6.00	....	4.75	....
	Free from pain	18	15.38	23	19.65	76	64.95	117	....	2	9.09	2	9.09	18	81.81	22	....
	Average length of flow (in days)	5.38	....	4.60	....	5.17	....	5.09	....	6.50	....	5.00	....	5.91	....	5.90	....
	Total number of anteversions	25	15.62	40	25.00	95	59.37	160	72.72	5	13.88	8	22.22	23	63.88	36	16.36
	Average length of flow (in days)	5.32	..	4.57	....	5.08	....	4.99		4.80	....	5.00	....	5.69	....	5.41	....
Retroversions.	With pain at the beginning of the flow	2	14.28	6	42.85	6	42.85	14	....	....	....	3	60.00	2	40.00	5	....
	Average length of flow (in days)	5.00	....	2.83	....	4.83	....	4.00	....	....	....	7.00	....	4.00	....	5.80	....
	With pain during the flow............	6	25.00	11	45.83	7	29.16	24	....	4	66.66	1	16.66	1	16.66	6	....
	Average length of flow (in days)	4.66	....	5.00	....	5.14	....	4.96	....	5.50	....	7.00	....	6.00	....	5.83	....
	Free from pain	24	16.10	34	22.82	91	61.07	149	....	....	....	3	21.42	11	78.57	14	....
	Average length of flow (in days)	4.33	....	4.00	....	5.14	....	4.75	....	....	....	5.33	....	4.63	....	4.78	....
	Total number of retroversions.......	32	17.11	51	27.27	104	55.61	187	82.75	4	16.00	7	28.00	14	56.00	25	11.06
	Average length of flow (in days)	4.43	....	4.07	....	5.12	....	4.72	....	5.50	....	6.28	....	4.64	....	5.24	....

TABLE XXI.—*Continued.*

		Never Regular.								Summary.[1]							
		Single.		Sterile.		Fruitful.		Total.		Single.		Sterile.		Fruitful.		Total.	
		No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	Total No. of versions.	Percentage on total number.
Anteversions.	With pain at the beginning of the flow	1	33.33	....	....	2	66.66	3	....	1	3.44	6	20.69	22	75.86	29	13.18
	Average length of flow (in days)	4.00	....	....	....	3.50	....	3.66	....	4.00	....	4.66	....	4.40	....	4.44	
	With pain during the flow.	....	....	4	44.44	5	55.55	9	....	10	25.00	21	52.50	9	22.50	40	18.18
	Average length of flow (in days)	....	....	6.25	....	4.20	....	5.11	....	4.70	....	4.95	....	5.00	....	4.90	
	Free from pain........................	5	41.66	....	....	7	58.33	12	....	25	16.55	25	16.55	101	66.88	151	68.63
	Average length of flow (in days)	5.40	....	....	....	5.71	....	5.58	....	4.48	....	4.64	....	5.34	....	5.25	
	Total number of anteversions.........	6	25.00	4	16.66	14	58.33	24	10.90	36	16.36	52	23.63	132	60.00	220	
	Average length of flow (in days)......	5.16	....	6.25	....	4.85	....	5.16	....	5.22	....	4.77	....	5.16	....	5.58	
Retroversions.	With pain at the beginning of the flow	....	....	....	....	2	100.	2	....	2	9.52	9	42.85	10	47.62	21	9.29
	Average length of flow (in days)......	....	....	....	....	5.50	....	5.50	....	5.00	....	4.22	....	4.80	....	4.57	
	With pain during the flow...........	2	50.00	1	25.00	1	25.00	4	....	12	35.29	13	38.23	9	26.47	34	15.04
	Average length of flow (in days)	5.00	....	3.00	....	6.00	....	4.75	....	5.00	....	5.00	....	5.33	....	5.08	
	Free from pain	2	25.00	2	25.00	4	50.00	8	....	26	15.20	39	29.80	106	61.98	171	75.66
	Average length of flow (in days)	4.00	....	7.50	....	3.75	....	4.75	....	4.30	....	4.28	....	5.03	....	4.75	
	Total number of retroversions	4	28.57	3	21.42	7	50.00	11	6.19	40	17.69	61	26.99	125	55.31	226	
	Average length of flow (in days)......	4.50	....	6.00	....	4.57	....	4.85	....	4.55	....	4.42	....	5.04	....	4.78	

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[1] Of all women having anteversion, with pain at the beginning, one. or 3.44 per cent., were single; six, or 20.69 per cent., were sterile; and twenty-two, or 75.86 per cent., were fruitful, etc. etc. Although not shown in the table it may be stated that of the single women who had *anteversion* 2.77 per cent. had pain at the beginning; 27.77 per cent. during the flow; and 69.44 per cent. were free from pain. Of the sterile 11.53 per cent. had pain at the beginning; 40.38 during the flow; 48.07 free from pain. Of the fruitful 16.66 had pain at the beginning; 6.81 during the flow; 76.51 free from pain. Of the single women who had *retroversion*, 5.00 per cent. had pain at the beginning; 30.00 during the flow; 65.00 free from pain. Of the sterile 14.75 had pain at the beginning; 21.31 during the flow; 63.93 free from pain. Of the fruitful 8.00 had pain at the beginning; 7.20 during the flow; 84.80 free from pain.

beginning of the menstrual flow, but which ceases as soon as this becomes established, is almost characteristic of this form of flexure. Observation has shown that with elongated cervix the position of the uterus is frequently changed from an anteversion to a retroversion, before the flexure has become permanent. We have learned also that, with uncomplicated version of the uterus, if dysmenorrhœa exists, the pain is experienced almost without exception during the time of the flow.

Fifty-two and a half per cent. of those who at puberty had pain during the flow were sterile in after life. By reference to Table V. page 157, we will see that this is almost the same proportion as was found for sterile women on the general average. In other words, it was found that, of all women, who at puberty had suffered pain during the flow, more than half proved to be sterile in after life. As this average is rather less than the general one, we cannot, from the character of the pain alone, accept it as evidence that the version, if it then existed, was the cause of the dysmenorrhœa.

Sixty-eight and sixty-three one-hundredths per cent. of all women who had anteversions in after life had been free from pain at puberty, and of these, 66.88 per cent. were fruitful.

It was found that the proportion of fruitful women who had pain at the beginning of the flow, and suffered in after life with retroversion or anteversion, was greater than for either the sterile or unmarried. For those with pain during the flow, the proportion was greater for the sterile and unmarried, although the pain was not so great. In a similar manner, it will be seen that, of those free from pain, the proportion was greatest for the fruitful woman. It will be noticed that 75.66 per cent. of those with retroversion had no pain at the beginning of menstrual life, this being a much larger proportion, under the same circumstances, than was found even for those having anteversion. Only 15.04 per cent. suffered pain during the flow at puberty; and finally 82.75 per cent. of these cases were regular without delay. These facts are additional indications, in support of the supposition which has already been advanced, that retroversions take place, as a rule, after puberty; it being well known that when a retroversion is detected in after life, painful menstruation is then the rule. In fact with these cases suffering from retroversion, the proportion of those with pain during the flow is far greater even than that given for the number who menstruated for the first time without pain. It cannot be supposed that retroversion could exist so many years without having, as a consequence of the malposition, a condition, or disease, established which would have sooner called for relief. This we must admit or hold that the displacement is in itself of little consequence unless some other condition coexists.

The length of period at and after puberty is also shown in Table XXI. For both forms of version, with pain at the beginning of the flow, the length of period was less than that shown by Table II., page 155, for the general average. When pain existed during the flow the average duration was much less for anteversion, and a trifle more for retroversion, by the same standard. For those women who did not suffer pain, these averages were reversed. On all cases of anteversion the average duration was greater than the general one taken on all women under observation, while the reverse was true for the total number of retroversions, and for each class of women with retroversion, except the fruitful, with whom the duration of the flow was longer.

On account of the small number of lateral versions (sixteen) they were not included with the other displacements in Table XXII. Any deductions drawn from statistics based on so small a number would be of little value if they did not fully confirm, as they however do, those already drawn from a study of the other displacements. Thus of the sixteen women with lateral version one, or 6.25 per cent., had pain at the beginning of the flow; four, or 25 per cent., during the flow; and eleven, or 68.75 per cent., were free from pain at puberty. Eleven, or 68.75 per cent., were regular from the first; four, or 25 per cent., were so after a certain time; and one, or 6.25 per cent., was never regular. The average length of menstruation, with pain in the beginning of the flow, was four days; with pain during the flow four days; and for those who were free from pain 4.90 days. Those who were regular from the first, menstruated on an average 5 days, and for those who became regular afterwards, the average was only 3.50 days, much less than that for the same conditions with either of the other forms of version. Five days was the average length for the only woman who was never regular, and the average for all cases of lateral version was 4.62 days. Of the total number, one, or 6.25 per cent., was unmarried; eleven, or 68.75 per cent., were sterile; and four, or 25 per cent., were fruitful in after life.

Table XXII. is designed to show the after changes in menstruation, particularly as to the length of flow. The first impression is one of surprise that the averages on the total number should exhibit so little change in the length of the flow, seeing that the extremes are two and ten days. If we consult Table XII., which shows the after changes in menstruation, and which was made up from all the women under observation, without reference to versions or to disease, the

TABLE XXII.—*Showing the Condition of Menstruation in After-life, where Versions of the Uterus existed.*

The Average length of flow is expressed in days.			MENSTRUATION UNCHANGED IN LENGTH.															
			Length of flow remained unchanged from the beginning, as to time or quantity, being								Length of flow remained unchanged, but the quantity became afterwards							
			Normal,		Too free,		Scanty.		Total.		Increased,		Lessened,		Irregular,		Total.	
			No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No of cases.	Per cent.
Anteversions.	Unmarried	Number of cases	10	58.82	3	17.64	4	23.52	17	47.22	....	....	4	57.14	3	42.85	7	19.44
		Percentage	25.00	....	25.00	....	30.77	....	26.15	....	....	....	13.33	....	25.00	....	9.45	....
		Average length of flow	5.20	....	7.33	....	4.00	....	5.29	....	....	....	4.75	....	4.66	....	4.71	....
	Sterile	Number of cases	11	68.75	3	18.75	2	12.50	16	30.76	5	31.25	9	56.25	2	12.50	16	30.76
		Percentage	27.50	....	25.00	....	15.38	....	24.61	....	15.62	....	30.00	....	16.66	....	21.62	....
		Average length of flow	5.09	....	7.66	....	6.00	....	5.68	....	5.00	....	4.88	....	4.00	....	4.81	....
	Fruitful	Number of cases	19	59.37	6	18.75	7	21.87	32	24.24	27	52.94	17	33.33	7	13.72	51	38.63
		Percentage	47.50	....	50.00	....	53.84	....	49.23	....	84.37	....	56.66	....	58.33	....	68.91	....
		Average length of flow	5.10	....	6.33	....	2.14	....	4.68	....	5.55	....	4.88	....	3.43	....	5.03	....
	Total	Number of cases	40	61.53	12	18.46	13	20.00	65	29.54	32	43.24	30	40.54	12	16.21	74	33.63
		Average length of flow	5.12	...	6.91	....	3.30	....	5.00	....	5.47	....	4.86	....	3.83	....	4.95	....
Retroversions.	Unmarried	Number of cases	17	73.91	2	8.69	4	17.37	23	57.50	3	50.00	2	33.33	1	16.66	6	15.00
		Percentage	26.56	....	15.38	....	25.00	....	27.73	....	9.67	....	7.69	....	9.09	....	8.80	....
		Average length of flow	4.70	....	7.00	....	1.75	....	4.39	....	6.66	....	5.00	....	3.00	....	5.50	....
	Sterile	Number of cases	18	60.00	5	16.66	7	23.33	30	49.18	7	43.75	6	37.50	3	18.75	16	26.22
		Percentage	28.12	....	38.45	....	43.75	....	32.25	....	22.58	....	23.07	....	27.27	....	23.53	....
		Average length of flow	4.33	....	6.60	....	4.28	....	4.70	....	3.71	....	5.50	....	3.66	....	4.37	....
	Fruitful	Number of cases	29	72.50	6	15.00	5	12.50	40	32.00	21	45.65	18	39.13	7	15.21	46	36.80
		Percentage	45.31	....	46.15	....	31.25	....	43.01	....	67.74	....	69.23	....	63.62	....	67.64	....
		Average length of flow	4.79	....	6.66	....	2.00	....	4.72	....	5.62	....	4.77	....	4.85	....	5.17	....
	Total	Number of cases	64	68.81	13	13.97	16	17.20	93	41.15	31	45.58	26	38.23	11	16.17	68	30.08
		Average length of flow	4.64	....	6.69	....	2.93	....	4.73	....	5.29	....	4.96	....	4.36	....	5.01	....

	[illegible]	Number of cases	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		Percentage	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		
		Average length of flow	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	..	5.10
	Total	Number of cases	[illegible]	[illegible]	[illegible]	[illegible]	4	9.09	44	[illegible]	[illegible]	[illegible]	1	[illegible]	3	8.10	37	16.81	220
		Average length of flow	[illegible]		6.66	....	5.50	....	[illegible]		[illegible]		3.00	....	4.00	....	3.37	....	5.05
Retroversions.	Unmarried	Number of cases	4	50.00	....	....	3	50.00	6	15.00	5	100.	....	....	....	....	5	12.50	40
		Percentage	[illegible]	....	....	....	[illegible]	....	[illegible]	....	[illegible]	....	....	....	....	....	14.70	....	
		Average length of flow	5.66	....	....	....	5.16	....	5.66	....	2.80	....	....	....	....	....	2.80	....	4.55
	Sterile	Number of cases	2	50.00	1	25.00	1	25.00	4	6.55	11	100.	....	....	....	....	11	18.03	61
		Percentage	[illegible]	....	[illegible]	....	[illegible]	....	[illegible]	....	[illegible]	....	....	....	....	....	12.35	....	
		Average length of flow	5.50	....	7.00	....	7.00	....	5.25	....	3.00	....	....	....	....	....	3.00	....	4.40
	Fruitful	Number of cases	18	85.71	2	9.52	1	4.76	21	16.80	18	100.	....	....	....	....	18	11.40	1?5
		Percentage	78.26	....	66.66	....	[illegible]	....	67.74	....	[illegible]	....	....	....	....	....	[illegible]	....	
		Average length of flow	6.88	....	6.50	....	10.00	....	7.00	....	3.33	....	....	....	....	....	3.33		5.07
	Total	Number of cases	24	74.19	3	9.67	5	16.13	31	13.71	34	100.	....	....	....	....	34	15.01	226
		Average length of flow	6.60	....	6.66	....	6.80	....	6.64	....	3.14	....	....	....	....	....	3.14	....	4.80

same general average will be observed. We may note in practice great changes in the amount of flow, but after the habit as to time has been once formed, the average length will vary but little, unless the circulation should have been affected by a new growth.

Two divisions have been made in the table, and these are again subdivided. The first is composed of those with whom the length of period remained unchanged in after life. In the second are those with whom both length and quantity became changed. The first division is made up of two classes: in the one, menstruation, whether normal, too free, or scanty, remained unchanged both in length and quantity, while in the other, length only remained unchanged, but the quantity became increased, lessened, or irregular. The length of the flow of those forming the first class of the second division became increased, while the quantity was increased, lessened, or became irregular. In the second class the length of flow became lessened, while the quantity lessened, increased, or became irregular.

In connection with what has been already stated, regarding the changes in the length of the menstrual flow, it will be of interest to note that those forming 63.18 per cent. of the cases of anteversion and 58.44 per cent. of the retroversions remained unchanged. Of the first subdivision 29.54 per cent. of the anteversions, and 41.15 per cent. of the retroversions underwent in after life no change in either length of flow or in quantity. There are many points of interest, if not of practical importance, given in this table, particularly in the comparative percentages between the unmarried, sterile, and fruitful women.

Table XXIII. is a summary of the preceding one, giving the changes of menstruation for both forms of version, without reference to the social condition. That menstruation, as is shown by this table, should remain normal, without change in either length or quantity of flow, in so large a proportion of cases suffering from retroversion, is a circumstance for which no explanation can be offered. It is even more surprising that the proportion of normally menstruating women with this form of displacement should be much greater than is found for those with anteversion.

If these data teach us anything, it is that these displacements are not common or frequent at the time of puberty, and that, if they are, the mere position of the uterus is of little moment when no complication exists.

An extreme degree of anteversion can and does frequently exist as a natural position for some uteri, without producing the slightest inconvenience, unless the organ becomes enlarged, from some obstruction

TABLE XXIII.—*Changes of Menstruation for both forms of Version.*

		LENGTH OF MENSTRUATION UNCHANGED.								TOTAL.			CHANGED IN BOTH LENGTH AND QUANTITY.								TOTAL.			SUMMARY.		
		Flow remained unchanged, as to length and quantity, being from the beginning either				Length of flow remained unchanged, but the quantity became afterwards, either							Length of flow increased, with the quantity either				Length of flow lessened, with the quantity either									
		Normal.	Too free.	Scanty.	Total.	Increased.	Lessened.	Irregular.	Total.	No. of cases.	Average length of flow.	Per cent. for each condition.	Increased.	Lessened.	Irregular.	Total.	Lessened.	Increased.	Irregular.	Total.	No. of cases.	Average length of flow.	Per cent. for each condition.	No. of cases.	Average length of flow.	Per cent. for each condition.
For anteversions.	Normal	40	..	..	..	..	..	..	..	40	5.12	28.77	..	..	..	..	..	..	..	..	..	..	..	40	5.12	18.18
	Scanty	..	..	13	..	..	..	..	..	13	3.30	9.35	..	..	..	..	..	..	..	..	..	..	..	13	3.30	5.90
	Too free, or increased	..	12	..	..	32	..	..	..	44	5.86	31.65	37	..	..	..	..	1	..	..	38	6.60	46.91	82	6.20	37.27
	Lessened	..	..	..	..	..	30	..	..	30	4.86	21.57	..	3	..	..	33	..	..	..	36	3.61	44.44	66	4 18	30.00
	Irregular	..	..	..	..	..	..	12	..	12	3.83	8.63	.	..	4	..	..	..	3	..	7	4.85	8.64	19	4.21	8.63
	Total	..	..	..	65	..	..	..	74	139	3.11	..	..	..	..	44	..	..	..	37	81	5.12	..	220	5.05	
	Percentage on all conditions	18.18	5.45	5.90	..	14.54	13.63	5.45	..	..	..	..	16.81	1.36	1.81	..	15.00	.45	1.36							
For retroversions.	Normal	64	..	..	..	..	..	..	..	64	4.48	39.75	..	..	..	..	..	..	..	..	..	..	..	64	4.48	28.31
	Scanty	..	..	16	..	..	..	..	..	16	2.93	9.93	..	..	..	..	..	..	..	..	..	..	..	16	2.93	7.08
	Too free, or increased	..	13	..	..	31	..	..	..	44	5.70	27.32	23	..	..	..	..	..	..	..	23	6.60	35.38	67	6.01	29.65
	Lessened	..	..	..	..	..	26	..	..	26	4.96	16.14	..	3	..	..	34	..	..	..	37	3.43	56.92	63	4.05	27.87
	Irregular	..	..	..	..	..	..	11	..	11	4.36	6.83	..	..	5	..	..	..	..	..	5	6.80	7.69	16	5 12	7.08
	Total	..	..	..	93	..	..	..	68	161	4.73	..	..	..	..	31	..	..	..	34	65	4.81	..	225	4.80	
	Percentage on all conditions	28.31	5.75	7.08	..	13.71	11.50	4.86	..	..	..	..	10.17	1.32	2.21	..	15.04									

to its circulation, and begins to prolapse. These tables show, as we have seen, that a large proportion of retroversions can exist without any change necessarily taking place in menstruation. Yet, complete displacement cannot long exist without producing some disturbance of the nervous system. From continued pressure of the cervix against the anterior wall of the vagina, reflex irritation is likely to be excited long before any diseased condition becomes established in the organ itself. This is the condition when the displacement has become complete, but the uterus does sometimes remain for years partially retroverted, without producing any disturbance. When the organ is retroverted, the woman is certainly more liable to disease than she would be were the uterus in a better position. But it is not until the circulation becomes disturbed by some accidental cause, and prolapse takes place, that the demand for relief becomes urgent. It is, therefore, not so much the version, as the prolapse which excites disturbance in the circulation. The effect of prolapse on the circulation has been shown on page 128, and that the same result follows any undue elevation of the organ in the pelvis was also shown. The fact that a certain number of cases, suffering from retroversion, should have the menstrual flow increased, while the effect with others should be to lessen it, may possibly excite some surprise. The condition of the flow as to quantity is determined almost entirely by the position of the uterus, and by the length of time during which the version has existed. When the displacement has not been extreme, and its origin is more recent, the flow is generally free. On the other hand, when the version has been of long standing, or the circulation has become very much obstructed, from the existing degree of displacement, the period becomes, almost without exception, scanty or irregular.

Treatment of Versions.—A version, as has been stated, may exist for an indefinite period without causing any disturbance, so long as the organ does not prolapse sufficiently to increase the existing obstruction to the circulation. Whenever prolapse has occurred to an extent calling for relief, two plans of treatment will be applicable. First, to correct the displacement and version, so far as can be done by mechanical means. Secondly, to relieve the local cause of disease. Under the proper head extraneous causes of version will be treated of, and we will now refer only to the management of what we have termed, in contradistinction, idiopathic version.

The local treatment should consist in the frequent and continued use of hot-water vaginal injections, and of appropriate applications to the uterine canal. To give tone to the bloodvessels is essential, and even if the loss of power were confined to the uterus itself (which would be rare) we possess no better way of accomplishing the purpose than through the action of the hot water on the pelvic vessels. The details of local and general treatment have already been so fully considered under the head of general principles, that, to avoid repetition, their application to individual forms of disease must be left to the judgment of the reader.

When mechanical means are applicable in the treatment of versions, we will accomplish more marked results in the prompt relief obtained, and do more towards the final restoration to health than by any other plan of procedure. Retroversion and prolapse are the only forms of displacement for the correction of which we possess any reliable, or, as a rule, safe mechanical means.

When the uterus falls forward, or to either side, we can only relieve the sagging, or prolapse of the organ in the pelvis, by mechanical means. I have for many years held the view that an anteversion of the uterus is not a mal-position. That no degree of version will cause irritation of the bladder so long as the uterus remains in a healthy condition. But whenever the uterus becomes heavy from any cause, it will settle down in the pelvis, and the irritation produced will be in proportion to the amount of traction exerted along the anterior wall of the vagina. Vesical disturbance will occur as soon as the uterus reaches a point in the pelvis where traction is exerted directly on the neck of the bladder, and this occurs when either prolapse takes place or the uterus is dragged upward. I have verified, beyond question, the correctness of my view, that no degree of anteversion without prolapse produces disturbance, and that no relief is ever obtained by simply lifting the uterus to an upright position unless the prolapse is also corrected.

I have several times opened the bladder by making a vesico-vaginal fistula, for the relief of chronic cystitis in cases where the uterus was enlarged and anteverted. For a long time I was puzzled to account for the irritation and frequent desire to empty the bladder, which would continue after the operation, although I had satisfied myself that every drop of urine escaped through the artificial opening immediately after entering the bladder. I had also noticed the same irritation continue after the operation, when the uterus was retroverted. In both instances the original cause of the cystitis was the displacement of the uterus. With the anteversion, the uterus was prolapsed, and dragged the vesico-vaginal septum downward until traction was made directly on the neck of the bladder. With the retroversion, the same effect was produced by the dragging of the neck of the bladder upward. The irritation of the bladder was not relieved until the prolapse was corrected by lifting the uterus, without regard to the version, and maintaining it in its proper place by an instrument. In the other instance the retroversion had to be corrected, and the traction upward on the neck of the bladder removed by a properly fitting pessary.

Various devices have been contrived, with the exercise of much ingenuity, for forcing the organ into an upright position, and to a point which, in all probability, it never occupied. Any instrument making direct pressure on the anterior wall of the uterus, which is the chief seat of disease, and usually very tender, must prove a source of irritation. Such a plan of treatment is faulty in theory, and pernicious in practice. When these instruments give any relief, the result is brought about simply by their lessening the degree of prolapse. Even in the hands of an expert, great harm sometimes results from their use, and as all benefit to be derived can be obtained by simpler and safer means, these instruments should cease to be so generally employed. If, by any appliance, we can lift the uterus to a point where the obstructed venous circulation through the neighboring tissues can be relieved, it is all that can be accomplished by such means.

Great relief may be obtained by even increasing the degree of anteversion through the use of a pessary with a long enough curve in the posterior cul-de-sac, so as to lift the neck of the organ from the floor of the pelvis. By thus slinging, as it were, the uterus with the fundus resting against the pubis, and the cervix elevated, the circulation will rapidly improve, and the irritability of the bladder be lessened. We will also gain time by this means, since it will enable the patient to take more out-door exercise; and, by the use of the pessary, we will break the force or jar which is transmitted with every step to the uterus, so long as the cervix rests on the floor of the pelvis.

The treatment of retroversion of the uterus is more satisfactory, mechanical means can be better applied, and the good resulting from relieving the obstructed circulation is well marked on restoring the organ to its natural position. A recent case of retroversion can be reduced with comparative ease, and an instrument may be readily adjusted, which will keep the organ so far anteverted that it cannot return to its former position. If, however, the displacement has been of long duration, and the uterus has become flexed, the condition will, in all probability, have acted as a source of irritation in causing cellulitis more or less extensive. Frequently, even when no adhesion has been formed, a degree of congestion may have been kept up, which would require but a slight provocation to establish a fresh attack of inflammation. It is, therefore, wise to proceed with the greatest caution in any attempt for reducing a retroverted uterus, until we have been able fully to appreciate the condition. Should we find the uterus firmly bound down by adhesions, an unfavorable prognosis should not necessarily be given, for the organ may be replaced in time by exercising care, patience and good judgment. The reduction should not be attempted in a single effort but by frequent efforts, so that these bands may at length become so stretched and attenuated as to offer no longer any resistance.

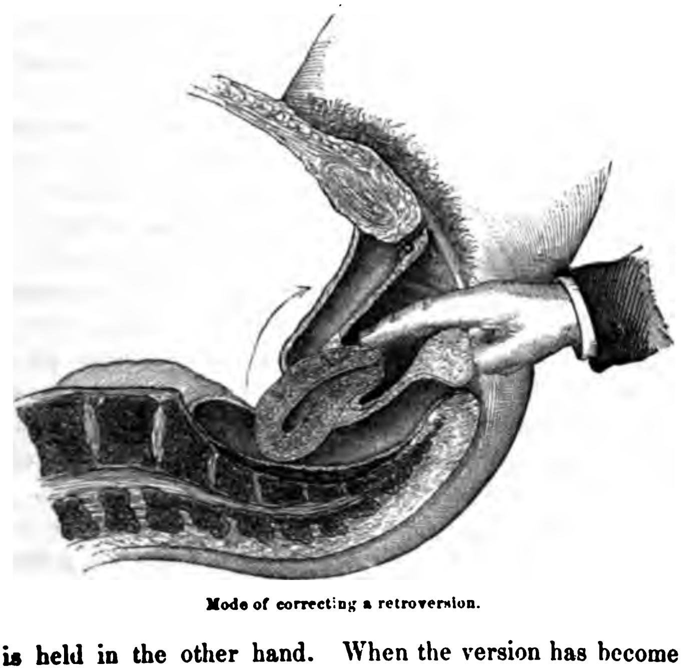
The utero-sacral ligaments, when not in a diseased condition, are scarcely worthy of note, since they consist only of a reduplication of the peritoneum, and a little cellular tissue. These ligaments, however, frequently become thickened from inflammation. Whenever the retroversion becomes complete, so that these thickened ligaments partially close over the enlarged uterus, they often present an obstacle, when we attempt to replace the organ, which might easily be mistaken for adhesions.

A retroverted uterus may be restored to its natural position by the sound, the elevator, or the finger, or by means of position and atmospheric pressure.

If we can ascertain the fact or feel reasonably satisfied that neither adhesions nor lurking inflammation exists in the neighboring cellular tissue, we may, with comparative safety, lift the uterus with the sound or any other means to which we have been accustomed. The use of the sound, however, for this purpose, almost always produces pain, and can never be regarded, even in the most skilful hands, as a means free from risk. The use of the elevator has already been fully described, and with ordinary care or dexterity, the instrument may be deemed safe, and should cause but little or no pain. The effect and employment of atmospheric pressure has also been fully considered.

I have long accustomed myself to rely on the use of the index finger for lifting a retroverted uterus into place, and, with a little practice, it becomes the most reliable means we can employ. It is one certainly attended with the least risk, as we are able to appreciate at once, in case of adhesions, the point and extent of resistance. For employing this method the patient is to be placed on the back, with the knees flexed, and the hips drawn down to the edge of the operating table or chair. Introduce then the index finger into the vagina, and direct the point of the tenaculum so that it may be hooked into the posterior lip just within the os. This instrument is to be used for the purpose of gently drawing forward the organ sufficiently toward the vaginal outlet, that we may be satisfied the fundus is distant enough from the hollow of the sacrum to pass the promontory when elevated. At the first attempt this manipulation must be done with care, and, if a point is reached at which great pain is produced, we must desist. By this manœuvre the uterus, of course, becomes more retroverted than before. To correct this, the perineum should be pressed firmly back, that the finger in the vagina may be passed up as far behind the uterus as possible, and made, at the same time, to lift the organ. When the fundus of the uterus has been thus elevated, and while it is being held up by the finger, the cervix is to be suddenly carried in an arc of a circle, downward and backward by means of the tenaculum which has been hooked in the anterior lip, and is held in the other hand. When the version has become complete, the fundus can be pressed up against the utero-sacral ligaments by aid of the finger in the vagina. These ligaments, having thus been put slightly on the stretch, gape as the tension is suddenly relaxed by carrying the cervix backward, and the fundus then slips between them. The finger must be quickly passed from the posterior cul-de-

Fig. 52.



Mode of correcting a retroversion.

sac against the anterior lip, the tenaculum withdrawn, and the organ thrown forward by passing, as shown in Fig. 52, the finger repeatedly down the anterior face of the uterus, so as to press the cervix downward and backward into the hollow of the sacrum.

A glance at the figure will show that the anterior wall of the bladder A—B, when made tense, becomes the fulcrum at A, over which the leverage is exerted. Therefore, when the cervix is pressed downward and backward, the fundus must to the same extent go forward in the direction indicated by the arrow. This manœuvre, however, will be found at first more rational in theory than easy in practice, since it requires some dexterity or sleight of hand to accomplish it.

The uterus is represented in the figure as if it had been drawn forward, and the fundus released from under the promontory of the sacrum. If the organ were left in this position, the cervix would soon settle towards the vaginal outlet, and the fundus into the hollow of the sacrum. It is, therefore, necessary to antevert the uterus immediately, and fit an instrument which will lift it in the pelvis, and at the same time carry the cervix so far backward that the weight of the organ itself will keep the fundus forward. If there were nothing in the pelvis in front of the uterus but the bladder, as represented in the figure, it would be easy to effect this. The intestines, however, are packed about the upper part of the uterus, and have to be displaced before the organ can be made to occupy another position. If we were simply to press the cervix downward and backward by a single effort, the rectum behind, and the intestines above, would be temporarily compressed by the fundus, but they would immediately recover their elasticity when the force was removed, and reproduce the original condition. The sleight of hand consists in keeping up the steady movement of the cervix backward, effecting the manipulation by a number of efforts, instead of a single one, the uterus being allowed to spring back, or slightly recover itself, after each advance. Then the cervix having been, by this means, carried as far back towards the hollow of the sacrum as the length of the finger will permit, the manœuvre must be repeated again and again until at length the fundus will have become turned over on to the bladder.

If an unusual degree of pain is experienced at any point, we must use our judgment as to how far it may be safe to proceed, or desist entirely for the time being, until all acute symptoms shall have subsided under the proper treatment. Even when successful, I frequently make [illegible] by mechanical means, to hold the uterus in position. I [illegible]ve again replaced it, and have satisfied myself that no tenderness on pressure exists at any point which would come in contact with the pessary to be used.

It is wise to proceed with great care after the reduction of a retroversion of long standing. Whenever I have met with more difficulty than usual, or have caused much pain in treating an office patient, I always have a large hot-water vaginal injection administered immediately, followed by a glycerine dressing in the vagina, and order several hours' rest before allowing the patient to return home. When treating patients in my hospital, under the same circumstances, I keep them in bed twenty-four hours, as a precaution. The result is that I now no longer have a dread of exciting cellulitis, which was formerly of frequent occurrence, when less care was taken to guard against it.

CHAPTER XVI.

PESSARIES.

Proper time for their use—Peculiarities to be met—Object of pessaries—Individual forms—Block-tin for modelling—Adjusting pessaries.

THIS subject is one of the most important and the least understood. There is a proper time for using these instruments, just as there is for a splint; and there is also a proper manner of applying them. Without full appreciation of both of these requirements, the damage inflicted by employing pessaries will be far greater than any chance benefit which may be obtained from them. From some members of the profession, the opposition to the use of pessaries is as denunciatory as if they were condemning a species of malpractice. This opposition may be sincere, but it is conclusive evidence of their ignorance. I have never known a practitioner who was able to fit a pessary properly, who was not also fully satisfied with the amount of benefit derived from its use.

The practitioner, to become an expert in fitting a pessary that it may do no harm, must have a decided mechanical talent; and, that the full benefit may be derived from the use of the instrument, he must be able to appreciate slight shades of difference which would be entirely overlooked by others. The first is a gift, which cannot be acquired; the second can be gained by experience, but is of little practical value unless associated with the first. I have known physicians, who, although quite dexterous in moulding the instrument, that it should do no harm, habitually failed in obtaining benefit from it, through want of observation or appreciation of what was to be accomplished in the individual case. Frequently, physicians have written to me with the request that I would send them a pessary for some case then under treatment, without their appreciating the necessity for doing as much as they would consider essential in order to obtain satisfaction in the fitting of a hat or any garment procured through the aid of another person. The great cause of failure and disappointment in the use of pessaries lies in the fact that the vagina is expected by many to adapt itself to any instrument which may be introduced, when in fact it is essential that the peculiarities of each individual case should be studied. In adjusting a pessary, the physician should pay as much regard to the peculiarities of shape and size of the vagina as the dentist does to those of the mouth when fitting a set of false teeth. I am fully aware that it will be considered an extravagant statement by many, but, nevertheless, I do not hesitate to make the assertion that scarcely two women can be found who will be benefited by wearing exactly the same shaped instrument. Fortunately, it is true, there are many women who are able to tolerate an ill-fitting instrument without receiving injury, but they are not benefited, except it be by sheer good luck.

Several years ago, I was urged to endorse a pessary which had some merit, but it had been patented. I refused on this ground, and as a matter of principle, since my self-respect would not allow my name to be associated with anything which was to be advertised. The inventor was so importunate that, to get rid of him, I pointed to a lot of old pessaries and told him, if he could find any two which were exactly of the same size and shape, I would change my mind. I had just had my office refitted, and into a small keg there had been thrown the accumulations of many years, in the shape of pessaries which had been formed from the ordinary block-tin rings. In full confidence, this man, having spread them over the floor, spent several hours looking over between five and six hundred pessaries which had been fitted and worn by as many individuals, but was unable to find what he sought for.

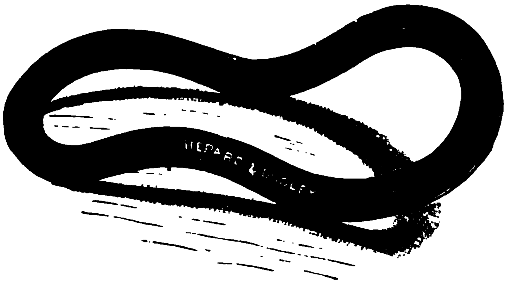
By reference to Chapter VIII., page 125, it will be seen that the necessity has been insisted upon for restoring the uterus to its proper place in the pelvis, where the circulation will be completely established. Unless this be done, it will prove a matter of little consequence how much care may have been bestowed on the shape of a pessary. The common error committed when attempting to correct a prolapse, is to lift the uterus too high in the pelvis; just in proportion as this is done above the health plane, by so much will traction be made on the connective tissue of the pelvis to obstruct the circulation, and with the same effect as if the organ had prolapsed to that degree below the proper line. It has been shown that when the prolapsed uterus is gently lifted from the floor of the pelvis on the extremity of the finger, a point will be reached when the patient will express herself as being relieved of all feeling of fulness and bearing-down. This feeling is to be our guide, and a valuable one it is when the patient is able to appreciate it. It is impossible to teach any one this art of judging of just how high the uterus should be lifted; it can be gained by experience alone, and then only by those who have been gifted by nature with the faculty of observation. When our judgment happens to be confirmed by the feelings of the patient, the result cannot be otherwise than satisfactory. It must be accepted as a rule, that when the instrument fits properly, and has corrected the prolapse, the patient will be unconscious of its presence in the vagina, and shall only realize the fact from the sense of relief afforded while standing or walking. It is scarcely probable that those who object to pessaries will be likely to attribute their past failures in obtaining good results from the use of the instrument to some defect within themselves. Yet, they may rest assured that such has been the case invariably, if the failures have occurred when the patient was in a proper condition to wear an instrument.

The Form of Pessaries to be Used.—Far more is dependent on the operator than on the actual form of the pessary. One skilled could effect more by a simple piece of bent wire, or by a pad of cotton, properly placed in the vagina, than another could with the aid of a complete armamentarium. Some modification, however, of Hodge's closed lever pessary, will be found applicable to the largest number of cases, as it conforms more nearly than any other to the natural shape of the vagina. The pessary should be fitted for the vagina without any outside appliance whatever, and to accomplish this is the perfection of the art. In practice we will scarcely ever meet with a case in which this cannot be effected, but it often requires exceptional skill. If there were no other objection to every outside appliance, the fact that the patient has to be manipulating it constantly would be sufficient to condemn it, and there can be no better plan devised for rendering a woman a confirmed invalid. After fitting a pessary, all aid should be given her to forget, as long as possible, that she is wearing a support, and this cannot be done if any portion be outside. Once the instrument has been given the proper shape, it does not require to be removed for months, during which time the uterus is supported steadily, without change, at the same plane in the pelvis, thus facilitating the gradual recovery of tone in the uterine ligaments. But, so long as the instrument has to be removed several times a day, and the position of the uterus is as often changed, no permanent advance will be made towards recovery.

After the conception of Hodge's closed lever pessary, I consider the most important advance was made by Dr. Sims, about 1859, in his recognition of the importance of fitting each pessary to the vagina, and in his suggesting the block-tin rings. These rings are made of an alloy of tin and lead, in such proportions as to be easily moulded, and yet unyielding enough for the pessary to keep its shape when placed in the vagina. After using these for some eighteen years, upon every occasion of their use endeavoring to make each instrument individual in its conformation, I believe that it would be impossible to devise a form of pessary that I have not employed.

Previous to 1868, I took, as a rule, the support for the instrument behind the symphysis, but since that time I have preferred to take it from the bottom of the posterior cul-de-sac. The shape, as given in Fig. 53, or some modification of it, represents the pessary I have generally employed at the Woman's Hospital, and also in private practice, since the date mentioned. It is of block-tin, moulded into proper shape, which may thus be used, or it may serve as a model for one to be made of hard-rubber, aluminium, or silver (gilded). Some time since, I furnished Dr. Leonard, of the firm of Shepard and Dudley, of New York, six pessaries of different sizes, but of the same general shape, to be made into hard-rubber. He has succeeded so well, that I now depend entirely on those furnished by him, only making such slight alterations as may be needed for any individual case. This is very readily done by means of a gas jet or a spirit lamp, care being taken, before heating the rubber, to smear the surface well with some simple ointment free from water. The grease is necessary to prevent the rubber from taking fire, and it should be free from water, as the steam causes the rubber to break while being bent. The surface to be moulded must be heated gradually, and if any portion should take fire, it must be withdrawn for a second and more grease applied. Whenever the substance has become soft enough, it is easily moulded into the desired shape, and can be held in this form

Fig. 53.



Block-tin pessary.

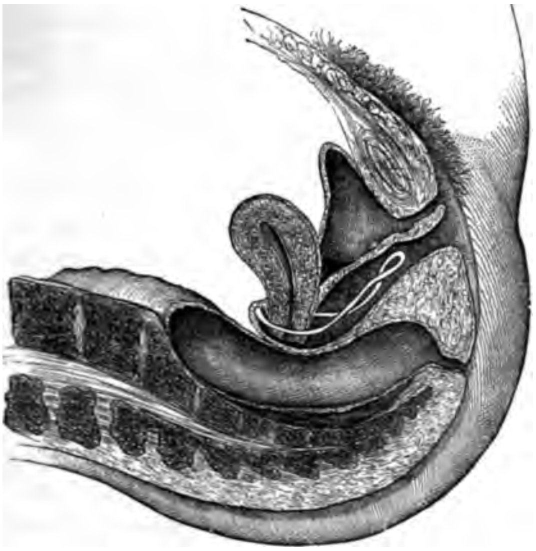
by the fingers until dipped into cold water to harden it. These pessaries, made by the models I have furnished, conform so closely to the general shape of the vagina, that after a selection of the proper length, they seldom require to be altered, except as to the width at any point, the curve for the posterior cul-de-sac, or the arc for the neck of the bladder.

An instrument on the principle of the closed lever pessary, and of the same general shape as those furnished Dr. Leonard, will, according to my experience, furnish the most useful form of support. But, to receive the full benefit from its use, it is necessary that the vaginal outlet should not be too large, and that the posterior cul-de-sac be of a natural depth. The fulcrum of this double lever rests on the bottom of the cul-de-sac, and in front against the posterior wall of the vagina. This latter support will prevent the instrument from slipping forward if there is no prolapse of the vaginal column below from absence of the perineum. The instrument should be curved at one extremity, with reference to the shape of this cul-de-sac and posterior wall, and bent at the other end in the opposite direction with a lesser curve, so that it will be balanced, as it were, in the vagina. But when the patient stands on her feet, the weight of the uterus will be thrown on the short lever forming the long curve in the posterior cul-de-sac. The leverage thus exerted will cause the other end, or long lever, to be elevated, so as to rest against the anterior wall of the vagina, near the neck of the bladder. This action is identically the same as if a weight were applied to the tail-board of a cart heavy enough to elevate the shafts. As the woman assumes the horrizontal position, and the weight of the uterus is again removed, the long lever of the instrument will rest in the axis of the vagina. This rocking movement does not, however, change the position of the uterus to any appreciable degree. As the posterior lever becomes depressed from the weight of the uterus above, the instrument will slide forward, in consequence of the shape of the cul-de-sac. This will take place just sufficiently along the upward curve of the posterior wall of the vagina, to compensate and prevent the occurrence of any prolapse. Then, as the weight of the uterus is removed, and the long lever of the instrument lies in the axis of the vagina, the posterior curve regains its position at the bottom of the cul-de-sac. The instrument will thus adjust itself by a change of position, so that it cannot cut into the vaginal tissues from continued pressure at any one point.

Whenever it is possible to avoid making the pubis the chief point of support, it should be done. But it is often unavoidable when the anterior wall of the vagina has become shortened in consequence of retroversion which has been of long standing, and where prolapse of the posterior wall has been produced from laceration of the perineum. Whenever the vaginal outlet has become so open as to permit the anterior and posterior walls of the vagina to prolapse, a surgical operation, to be described hereafter, will be necessary. Closure of the laceration through the perineum will be required before any properly fitting support can be worn with advantage for correcting the retroversion. But before this can be accomplished some pessary will be needed as a temporary means of relief, and the only available point of support will be from behind the symphysis. An instrument fitted under such circumstances must be made wider below, and with the greater curve also at this end, so that any downward pressure may have the effect of crowding the anterior extremity of the pessary well up behind the pubes. This renders it always necessary that a depression be made in the instrument to protect the neck of the bladder, since the chief support of the instrument must be gained in this neighborhood.

There are certain general laws which are equally applicable to the adjusting of all forms of pessaries. That such an instrument should do no harm, it is necessary that it be small enough to admit of the passage of the finger between it and the vaginal wall at any point while the patient lies on the back. It must be just large enough to give the needed support to the uterus, and be, at the same time, small enough to enable the vagina to regain gradually its natural size. The elasticity of the canal is sufficient to admit of a dilatation to the extent of the pelvic excavation, but it will be an exception to the rule when a pessary properly curved need ever be over three inches in length and about an inch and a half in width. To obtain the proper length for the pessary, my rule is, while the patient lies on the back, to pass the whalebone stick, or any blunt instrument, along the index finger into the posterior cul-de-sac, and measure from behind the pubes. I place the index finger behind the symphysis pubis, and then withdraw both it and the stick together, and take the ascertained measurement, less the thickness of the finger, as a guide for the length of the instrument. Thus measured, the instrument will be found of just the proper length, if the woman be examined while standing. After determining this important point, the next step will be to give the proper curve to that portion of the instrument which is to rest in the posterior cul-de-sac. When retroversion has existed, a longer curve will be needed in the cul-de-sac than when the instrument is required to lift the organ from the floor of the pelvis to relieve a prolapse, after enlargement of the uterus. With the latter condition, the upper portion of the vagina will be somewhat pear-shaped, or more dilated than below, and it will be necessary to make the instrument conform to this peculiarity. When a pessary is thus made larger above, so that the vaginal walls can close about it below, the effect is to crowd it upwards into the canal. An instrument should never be so abruptly curved, in the posterior cul-de-sac, as to make direct pressure against the uterus at its junction with the vagina, but at some little distance beyond it. The circulation in the neck and lower portion of the body is easily obstructed by pressure at this point. The consequence is, that engorgement of the uterus is soon produced, and, in the effort of nature to relieve it, a discharge takes place, which will form an erosion about the os, to be mistaken, in all probability, for and treated as ulceration. Even a more serious consequence arises if there be an urgent necessity for wearing a pessary. For, from direct pressure a state of irritation or inflammation of the lymphatic glands found in this neighborhood frequently becomes established, with an intolerance to the presence of any instrument in the posterior cul-de sac. Should the anterior wall of the vagina be short, and the curve of the pessary be such as to rest just at the junction of the vagina and uterus, the instrument must necessarily form a fulcrum, over which the organ will soon become retroverted. For those cases in which there is thickening of the posterior wall and retroversion, it is absolutely necessary that the curve of the instrument be such that it will pass as far as possible beyond the uterus into the cul-de-sac. This is necessary, not only that it should not furnish the fulcrum to reproduce the displacement, but also that the instrument may not cause irritation by touching the posterior wall of the uterus, which, in such cases, is always sensitive on pressure. As a rule, we cannot change a retroversion except by lifting the organ bodily up in the pelvis with a pessary so curved as to go far beyond into the cul-de-sac, as represented in Fig. 54. The uterus must then, in time, become anteverted and the flexure will be overcome. When the uterus is thus suspended, as shown in the figure, from the curve of a pessary, which extends too far above to admit of the recurrence of the retroversion, the organ must be crowded over forward. With the uterus in this position, the weight of the viscera above will force the fundus forward in the direction of the least resistance. This has the effect of keeping the cervix pressed against the posterior wall of the vagina, and will, in time, be likely to change the flexure into a simple version.

Fig 54.



Pessary applied for retroversion.

The extremity of the pessary going into the cul-de-sac should be rounded gradually, and not made too narrow in proportion to its length, unless there should be some special reason for doing so. The utero-sacral ligaments become sometimes inflamed, from the irritation established by a badly fitting pessary, resulting in a condition which it is difficult to relieve. These ligaments are, as we have seen, on each side of the uterus, just above the vaginal junction, and, extending to the sacrum, form partially the sides of Douglas's cul-de-sac. Frequently inflammation is produced by injudicious distribution of pressure from a pessary so curved as to rest against the uterus just at its junction with the vagina. The same result frequently follows the use of a pessary of which the upper end has been made somewhat square, having two corners which, by imbedding into the tissues, localize the pressure too much, and produce irritation; also by forcing the ligaments as far apart as their near attachment to the uterus will permit. The well-defined and thickened edges of these ligaments are often found to be exceedingly sensitive to pressure, as the finger is passed into the posterior cul-de-sac. Should this condition be overlooked, and a pessary be introduced without some proper preparatory treatment, an attack of pelvic cellulitis will most likely result. To remove this sensitiveness, it is necessary to use the hot-water vaginal injections, to apply iodine freely to the surface of the cul-de-sac every third or fourth day, and to endeavor to gain some support for the uterus. This condition of the ligaments may be kept up for an indefinite length of time, if there be no restraint placed on the movements of the patient. While on the feet, the weight of the uterus and viscera above is sustained chiefly by these ligaments, and more especially so, if they have become shortened by previous inflammation. It is, therefore, necessary for a limited time, that the patient remain chiefly in the recumbent position, when this can be done without detriment to the general health. If necessary, as a temporary expedient to allow of the patient's exercising, the needed support can generally be supplied by a cotton pessary, in the shape of a half-grown mushroom, placed in front of the cervix. This is made by taking a square pledget of damp cotton, pressing it between the hands, and folding the corners over towards the centre, until a ball has been formed of the proper size. Then as the corners are held between the extremities of four fingers, the stem portion is formed by wrapping a cord about the cotton between the ends of the fingers and the ball portion. When well formed, saturated with glycerine, and properly placed, this will make a useful support for simple prolapse.

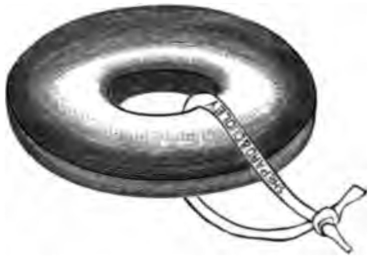
If the patient lies on the back, with her limbs flexed, and has the perineum depressed by two fingers of the operator, it will be an easy matter, by the aid of a pair of forceps, to introduce this cotton pessary: and if it is of a proper size and so placed as to avoid making pressure on any sensitive point, it will give great comfort and support for hours.

In the absence of the posterior cul-de-sac, or where this portion of the vagina is unusually small, retroversion is always found. This is in consequence of the space being too limited for the cervix, which can only press forward in the axis of the vagina, with the effect of throwing the fundus into the hollow of the sacrum. This class of cases we find among young girls or sterile women, and it is a condition exceedingly difficult to correct until more room be gained for the cervix to lie in the cul-de-sac. This space can be gained and the retroversion reduced only by a perfectly straight or flat pessary, fitted to receive its support from behind the symphysis. Then it will be requisite that the instrument put the vagina sufficiently on the stretch to carry the neck of the uterus so far into the hollow of the sacrum as to produce an anteversion. On account of the peculiar form of instrument, and as the vaginæ of these cases are always small, great care is needed in fitting the pessary, and watchfulness afterwards, that it does not cut into the tissues. Particularly is this care necessary in fitting the instrument about the pubes. We here find occasionally, a difference in the curve, on each side of the symphysis, so that, if a pessary be made symmetrical, it may break and cut into the soft parts covering the lesser curve. In these cases, with the vagina small, there should be no sharp angles but a gradual curve. Frequently, it is necessary to bend the corners downward, to correspond with the roof of the vagina, at this point, and a depression for the urethra should also always be made.

The shorter the vagina (that is, from deficiency of the cul-de-sac), the straighter must the instrument be, for, if curved too much, it will rotate and remain across the axis of the canal. A straight instrument has to be wider in the middle, in proportion to its length, than a curved one. The widest part of the vagina is from one sulcus to the other, while the lateral walls and posterior surface of the canal form a concavity. Consequently, a curved instrument should be made smaller in the middle, as its support is chiefly derived from the posterior wall of the vagina. It is a very common occurrence to find a pessary, when too wide, cutting its way along the lateral walls of the vagina, at the bottom of a deep fold which it forms as it is carried downward from the pressure above.

For the purpose of illustrating the use of the cotton pessary, it was described somewhat out of place, but with it should be classed the hollow India-rubber disk. This disk, of the shape given in Fig. 55, but a little larger, is made of thin rubber and inflated. There are certain conditions in which this form of support will be frequently found most useful, and, whenever the glycerine is not particularly needed, the disk will answer the purpose better for continued use than the cotton pessary. It is chiefly useful for the treatment of cases, when, in consequence of a previous attack of cellulitis, there still remains too much tenderness on pressure for the use of an ordinary pessary. To avoid making pressure on the urethra, or any other point, a depression can be made on one side by passing a small elastic band once or twice around the thickness of the instrument. This

Fig. 55.



Rubber disk pessary.

disk may be placed in front or behind the uterus, according to circumstances. It answers for anteversion when placed in front of the cervix, provided no tenderness exists on the anterior wall; or it may be introduced behind, in the posterior cul-de-sac if large enough, and if there has been no cellulitis in the neighborhood. I have used the instrument chiefly where cellulitis has existed in one of the broad ligaments, and when the inflammation has subsided sufficiently to render it safe for the patient to commence outdoor exercise. The use of the disk, in these cases, will prevent the uterus from sagging in the pelvis while the patient stands, and thus protect the shortened broad ligament from traction. It may be so placed in the axis of the vagina, that the depression made by the band shall be situated in such a way as to protect from pressure the thickened ligament which had been inflamed. Or the instrument may be introduced across the vagina, in front of the cervix, according to the capacity of the vagina, and the amount of thickening. To facilitate the introduction, it is only necessary to compress the disk between the fingers after it has been lubricated with a little soap and water. Grease should not be employed, as it destroys the elasticity and rots the material. The offensive discharge from the vagina produced by the long use of India-rubber is a serious objection. If it remains in the vagina for a length of time, pruritis is often caused by it, and even vaginitis may be established. Any instrument formed from this material should, therefore, be only for temporary use, or until a better substitute can be found. The irritating effects of the rubber can be guarded against, if the patient will take the trouble to remove the instrument whenever it is not needed to aid her in exercising, and at night. As soon as it has been removed, it should be carefully cleansed in cold water, and wiped dry. A loop of cord passed through the open ring in the centre of the instrument will greatly facilitate its removal. By degrees, the air will escape, so that the instrument will become partially collapsed, but it can be again easily inflated by means of a hypodermic syringe. A thickened portion can be readily felt in the side of the disk, through which the air was introduced in the first instance. As the syringe will have to be refilled several times with air, it must be detached from the needle. This necessity is obvious, since so many additional punctures would allow the air to escape only the more readily. While the syringe is detached, the finger should be placed over the opening in the needle to prevent the escape of the air already introduced.

Under no circumstance should a piece of sponge be introduced into the vagina as a substitute for a pessary. Of all substances which could be employed for the purpose this becomes the most offensive. But the most serious objection to its use is its dilating quality, which will in time expand the vagina to the full size of the pelvic excavation; and it ceases to give the needed support without the size is increased from time to time, besides which its continued use destroys all natural support and elasticity of the tissues, so much so that, when full dilatation of the canal has taken place, no instrumental appliance will any longer answer; and should it be necessary to resort to any surgical procedure to relieve the procidentia—a condition of frequent occurrence—it is difficult to obtain satisfactory union. I have frequently learned, on inquiry, that the use of the sponge has been recommended by physicians "who have no faith in pessaries," and, I may add, by those who are unable to fit them.

CHAPTER XVII.

ETIOLOGY OF UTERINE FLEXURES.

Tables (XXIV. to XXX.) showing the relations of flexures, general and special, to marriage, celibacy, pregnancies, miscarriage, menstruation, etc. etc.—Anteflexures—Retroflexures—Lateral flexures.

It would be difficult to account for the diversity of views entertained by prominent medical men regarding the origin and treatment of flexures except upon the supposition that the cause and effect of these troubles are often confounded. Let us see, therefore, if we cannot arrive at some definite knowledge on the subject, but to do this we must go back to the beginning of menstrual life, and study the initial stages of, and the subsequent changes in the different forms of flexures. We may thus be able to analyze symptoms, to separate the cause of one flexure from another, and to appreciate that their origin varies, and that the treatment must vary with the form. For this purpose there will be presented the data obtained from the records of three hundred and forty-five cases which have passed under observation in my private hospital.

We shall consider first, flexures of the cervix, at, or below the vaginal junction; and secondly, those of the uterine body, forward, backward, and lateral, the last being, in all probability, but deviations from the other two forms of flexure of the body. Table XXIV. shows that one hundred and eighty-two women were found with flexure of the cervix, of which sixty-two were unmarried, one hundred and thirteen sterile, and seven were doubtful as to previous pregnancy. There were ninety-one flexures of the uterine body forward, consisting of fourteen unmarried, forty-two sterile, and thirty-five fruitful so far as to have been impregnated. Seven unmarried, nine sterile, and thirteen fruitful women suffered from retroflexion, in all 29. Forty-three were found with lateral flexures, of which number six were unmarried, twenty-five sterile, and twelve had been impregnated.

52.75 per cent. of all the flexures were of the cervix, and 47.24 per cent. of the body; 26.37 per cent. of the whole number were of the body forward, 8.40 per cent. backward, and 12.45 lateral. The proportion of unmarried was 69.66 per cent. for flexures of the cervix, and 30.33 per cent. for flexures of the body. For the sterile, 59.78 per cent. were of the cervix, and 40.21 per cent. of the body. For the fruitful, 10.44 per cent. were flexures of the cervix, and 89.55 per cent. of the body. Thus, of all women with flexures, 25.80 per cent. were unmarried, 54.76 per cent. were sterile, and 19.43 per cent. were fruitful. The proportion for the total number of all flexures was 14.09 per cent. of all the cases of every description under observation.

Table XXIV.—*Flexures of the Uterus.*

	Flexures of the uterine body.								Total flexures of the body.	Flexures of the cervix.		Total body and cervix.
	Forward.	Percentage	Backward.	Percentage.	To the right.	Percentage.	To the left.	Percentage.		Number.	Percentage.	
Unmarried	14	15.61	7	7.88	4	4.49	2	2.24	27	62	69.66	89
Percentage	15.38	51.85	24.13	25.92	28.57	14.81	6.89	7.40	16.56	34.06	...	25.80
Sterile	42	22.22	9	4.76	8	4.12	17	8.99	76	113	59.78	189
Percentage	46.15	55.26	31.03	11.84	57.14	10.52	58.62	22.36	46.62	62.18	...	54.76
Fruitful	35	51.79	13	19.40	2	2.98	10	14.92	60	7	10.44	67
Percentage	38.46	58.33	44.82	21.66	14.28	3.33	34.08	16.66	36.81	3.84	...	19.43
Total	91	26.37	29	8.40	14	4.05	29	8.40	163	182	...	345
Percentage	55.82	...	17.77	...	8.50	...	17.77	...	47.25	52.75		

By reference to Table III., page 156, will be seen the relative and actual proportion of the unmarried, sterile, and fruitful. The unmarried with flexures were 8.01 per cent., and the sterile 27.36 per cent. in excess of the average, while for the fruitful the liability to flexure is 35.95 per cent. less than the general liability. It is thus evident that the woman who has been impregnated is rarely found with a flexure of the cervix, and in comparison with other women is but little liable to flexures of the uterine body.

The proportion of flexures of the cervix was for the unmarried 34.06 per cent., for the sterile it was 62.18 per cent., and for the fruitful only 3.84 per cent. Now, as to the total number of the married women with this condition of the cervix 94.16 per cent. were sterile. My convictions are that the proportion is even greater, since I have never observed a marked case of flexure of the cervix in any woman who had gone to full term. In a total of 182 cases we find only seven women with this form of flexure who were supposed to have been impregnated. After carefully going over the records of these cases, it was found that in five instances the

TABLE XXV.—*Flexures of Uterus, with Reference to Age at First Menstruation.*

	Age at first menstruation	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	Flexure of the cervix.	Flexures of the uterine body.					Total number of flexures of the cervix.	Total number of all flexures.	Average age at puberty.	Average age at marriage.
													Forward.	Backward.	To the right.	To the left.	Total.				
Unmarried.	Flexures of the cervix	2	2	4	15	17	12	5	4	1	....	62	....	....	....	....	....	62	....	14.01	
	Of the body. Forward	....	....	3	3	4	2	1	1	....	....	....	14	....	....	....	....	....	....	13.85	
	Of the body. Backward	....	....	1	3	....	1	1	1	....	....	....	....	7	....	....	....	....	....	14.11	
	Of the body. To the right	....	....	....	2	....	2	....	....	....	....	....	....	....	4	....	....	....	....	14.00	
	Of the body. To the left	....	....	....	1	1	....	....	....	....	....	....	....	....	....	2	....	....	....	13.50	
	Total	2	2	8	24	22	17	7	6	1	....	....	....	....	....	....	27	62	89		
	Percentage	2.24	2.24	8.98	26.56	24.75	19.10	7.97	6.73	1.12	....	....	15.38	9.87	4.39	2.19	31.47	68.53	16.56	13.98	
Sterile.	Flexures of the cervix	....	2	19	24	30	15	12	7	1	3	113	....	....	....	....	....	113	....	14.09	21.32
	Of the body. Forward	....	....	3	11	6	10	7	3	2	....	....	42	....	....	....	....	....	....	14.51	22.25
	Of the body. Backward	....	....	1	3	4	....	....	....	1	....	....	....	9	....	....	....	....	....	13.80	23.11
	Of the body. To the right	....	....	1	3	1	1	2	....	....	....	....	....	....	8	....	....	....	....	14.00	23.50
	Of the body. To the left	....	1	1	2	7	3	3	....	....	....	....	....	....	....	17	....	....	....	14.11	17.11
	Total	....	3	25	43	48	29	24	10	4	3	....	....	....	....	....	78	113	189		
	Percentage	....	1.58	13.22	22.75	25.39	15.34	12.69	5.23	2.11	1.58	....	22.46	3.74	4.27	9.[illegible]	[illegible]	59.78	46.62	14.19	21.90

TABLE XXV.—*Continued.*

Fruitful. To full term with no miscarriages.	Of the body.	Forward	....	....	1	4	5	2	1	3	....	....	....	16	....	....	....	....	....	....	14.43	20.35
		Backward	1	....	1	....	1	2	2	....	1	....	....	....	8	....	....	....	....	....	14.50	19.40
		To the right	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	12.00	18.00
		To the left	....	....	....	1	1	1	....	....	....	....	....	....	....	....	3	....	....	....	14 00	24.00
		Total	1	....	3	5	7	5	3	3	1	....	....	....	....	....	....	28	....	28		
		Percentage	3.56	....	10.71	17.85	15.00	17.85	10.71	10.71	3.56	....	....	57.14	28.57	3.57	10.71	100.	....	....	14.32	21.21
To full term and miscarriages.	Of the body.	Forward	....	....	1	2	....	1	3	....	....	....	....	7	....	....	....	....	....	....	14.42	19.47
		Backward	....	....	1	....	....	1	1	....	....	....	....	....	8	....	....	....	....	....	14.33	26.00
		To the right	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
		To the left	....	....	1	....	5	....	....	....	....	....	....	....	....	....	6	....	....	....	13.66	20.33
		Total	....	....	3	2	5	2	4	....	....	....	....	....	....	....	....	16	....	16		
		Percentage	....	....	18.74	12.50	31.25	12.50	25.00	....	....	....	....	43.75	18.75	....	37.50	100.	....	....	14.12	21.62
Only miscarriages.		Flexures of the cervix	1	....	1	....	2	2	....	1	....	....	7	....	....	....	....	....	7	....	13.85	19.42
	Of the body.	Forward	....	2	1	5	3	1	....	....	....	....	....	12	....	....	....	....	....	....	13.00	21.50
		Backward	....	....	....	....	2	....	....	....	....	....	....	....	2	....	....	....	....	....	14.00	19.00
		To the right	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	10.00	21.00
		To the left	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	14.00	20.50
		Total	2	2	2	5	8	3	....	1	....	....	....	....	....	....	....	16	7	23		
		Percentage	8.69	8.69	8.69	21.73	34.76	13.04	....	4.34	....	....	....	52.17	8.69	4.34	4.34	69.56	30.43	....	13.26	21.47
		Total	3	2	8	12	20	10	7	4	1	....	....	35	13	2	10	60	7	67		
		Percentage	4.47	2.98	11.94	17.91	29.85	14.93	10.44	5.97	1.48	....	....	....	....	....	....	....	....	36.80	13.91	22.31
Summary.		Total No. of all conditions, for each year	5	7	41	79	90	56	38	20	6	3	182	91	29	14	20	163	....	345		
		Percentage	1.02	1.58	10.12	21.13	25.93	17.28	12.51	6.99	2.22	1.17	....	....	....	....	....	....	....	....	14.08	22.01

[illegible] miscarriage had only been suspected by the physician, [illegible] had any mass or form been seen which might [illegible] product of conception. It is believed that future ob- [illegible] the fact that the existence of a flexure of the [illegible] is proof that impregnation had never taken [illegible]

[illegible] proportion of different flexures of the body to [illegible] that a little over half of all flexures of the [illegible] class of women. But, on the other hand, [illegible] anteflexions, it will be found that the [illegible] the proportion of 15.38 per cent. for the [illegible] for the sterile, and 38.46 per cent. for the [illegible] the unmarried suffering from anteflexion is [illegible] proportion that this class bears to the total [illegible] however, are 18.73 per cent. in excess of that [illegible] of fruitful women is shown to be 16.91 [illegible]

[illegible] to be comparatively rare, constituting but [illegible] and but 17.77 per cent. of those of the [illegible] relative frequency of retroflexions to the number [illegible] nearly in the proportion of one to three, if the [illegible] either the total number of all flexures, or on [illegible] The proportion for versions of the uterus is [illegible] the posterior displacement has been shown to be [illegible] met with than anteversion. Unmarried and [illegible] more liable to retroflexions than would be [illegible] general average, while fruitful women are some [illegible] to suffer from this lesion.

[illegible] shown by Table XXV. to be twice as frequent [illegible] among the unmarried, but with the reverse [illegible] and five times more frequent to the left for [illegible] also that the unmarried are less liable to [illegible] liability is twofold for the sterile, while [illegible] about the same per cent. below the average [illegible]

[illegible] menstruation for those with flexure of the [illegible] body 14.11, and on all flexures 14.08. [illegible] this lesion of the cervix, who were un- [illegible] and of the body 13.92; of the sterile [illegible] and 14.32 years for the body; the fruitful averaged 13.85 years for the cervix, and 13.91 years, for the flexure of the body. These figures give but little indication that the age of puberty has any bearing on the form of flexures, or of their existence at that time. The average age, however, both for those with flexure of the cervix, and those with flexure of the uterine body is a little earlier than that already given for the general average age of puberty; but this may be accidental. The delay in development for the sterile woman is about as much above the general average as the age of puberty for the unmarried and fruitful woman was below it. The only marked difference from the average age for those with flexures under all social conditions, is found among the women who had always miscarried, and had never gone to full term. The number is small, it is true, being only seven cases of flexure of the cervix, who were supposed to have miscarried, and sixteen with different flexures of the body. The average for those with flexure of the cervix was 13.85 years, and for those of the body 13 years, and for the total number 13.26 years. Now, the average age of first menstruation for 120 women, who had suffered from various diseases, but had never gone to full term, and only miscarried, was 13.38 years; an age far earlier than the general average for all women of which these formed a part. As the difference is decided in both instances, and even so great as one year for those with flexures of the body who had miscarried, the circumstance can scarcely be a mere coincidence.

Different degrees of regularity are found to exist with different flexures of the body, but the averages for those with flexure of the cervix are essentially the same as those taken upon all women under observation, and given in Table III., page 156. A comparison made between Table III., containing the general averages, Table XVI., containing those for anteversions, and the accompaning Table XXVI., for those who suffered from different forms of flexures, will present many points of interest for the student. By comparison, it is evident, so far as can be judged by the test of the woman's regularity, that flexures are formed, as a rule, in after life. This is particularly striking in regard to retroflexions; for the proportion of women who were found in after life with this form of flexure, and were regular from the first, is much larger than is shown to have been the case for all women under observation. The proportion of those who were regular after a certain time, as well as those who were never regular, are also more favorable than those given in Table III., on the general average. A study of these tables will also point out a closer parallelism between versions and flexures; particularly is it well marked between retroversion and retroflexion.

TABLE XXVI.—*Condition of Menstruation with Flexures.*

	Condition of menstruation.	Unmarried.	Sterile.	Fruitful.	Total.
Flexures of the cervix.	Regular from the first	34	75	1	110
	Percentage	64.15	77.33	50.00	72.36
	Regular afterwards	12	10	1	23
	Percentage	22.64	10.20	50.00	15.13
	Never regular	7	12	....	19
	Percentage	13.20	12.37	....	12.50
	Total	53	97	2	152
	Percentage	34.86	63.82	1.31	
Anteflexures.	Regular from the first	6	27	25	58
	Percentage	42.85	69.23	78.12	68.23
	Regular afterwards	6	9	4	19
	Percentage	42.85	23.07	12.50	22.35
	Never regular	2	3	3	8
	Percentage	14.29	7.69	9.37	9.41
	Total	14	39	32	85
	Percentage. . . .	16.47	45.88	37.64	
Retroflexures.	Regular from the first	5	7	12	24
	Percentage	83.33	77.77	92.30	85.71
	Regular afterwards	....	2	1	3
	Percentage	....	22.22	7.69	10.71
	Never regular	1	....	....	1
	Percentage	16.66	....	....	3.57
	Total	6	9	13	28
	Percentage	21.42	32.14	46.43	
Lateral flexures.	Regular from the first	4	14	4	22
	Percentage	100.00	77.77	57.14	75.86
	Regular afterwards	....	2	1	3
	Percentage	....	11.11	14.28	10.34
	Never regular	....	2	2	4
	Percentage	....	11.11	28.57	13.79
	Total	4	18	7	29
	Percentage. . . .	13.79	62.07	24.13	

The want of regularity seems to have been some bar to fruitfulness. The number of sterile women, and of those who had been impregnated, having flexures of the uterine body, were about equal. The number observed, however, may be considered too small for any practical deductions to be drawn from them. But, I find, that of the total number of all women under observation, 197 cases, or 9.00 per cent., had never been regular; of these, 38.57 per cent. had been impregnated, and 35.53 per cent. were sterile. Although the number of each class who were never regular is practically the same, yet, as there were in the total number of women under observation more than twice as many fruitful as sterile, the proportion of sterile is in excess.

The condition of menstruation as to regularity seems to have but little connection with the amount of pain experienced.

It has already been shown by Table VII., page 160, that of 2178 cases at puberty, 13.63 per cent. had pain for a short time, at the beginning of the flow; 13.49 per cent. suffered pain during the flow; while 72.90 per cent. were free from pain. Of that number 22.61 per cent. of sterile women, and 8.52 per cent. of fruitful women had pain at the beginning of the flow. Of those who suffered pain during the flow, 25.29 per cent. were sterile, and 4.79 per cent. were fruitful women, while but 52.09 per cent. of sterile women were free from pain, in contrast to 86.67 per cent. of those who, in after life, proved fruitful. Painful menstruation is thus not only an indication of sterility, but, we shall see hereafter, it also points out the form of flexures. In Table XXVII. is given the condition of menstruation, as noted in 152 cases of flexure of the cervix. The unmarried and sterile constitute each about 50 per cent., and there were two women who were supposed to have miscarried. Of the total number of these flexures, 59.86 per cent. suffered pain at the beginning of the flow, 9.86 per cent. during the flow, while 30.26 per cent. were free from pain. Again, it will be seen that 49.05 per cent. of the unmarried, and 65.97 per cent. of the sterile had pain in the beginning of the flow; 7.45 per cent. of the unmarried, and 11.34 per cent. of the sterile suffered during the flow; while 43.39 per cent. of the unmarried, and 22.68 per cent. of the sterile were free from pain. Thus, we see that with flexures of the cervix pain in the beginning of the flow is the rule, and during the flow the exception. For the absence of pain, in a certain number of cases, we shall hereafter offer an explanation in another connection.

It will be noted that more than half the number of married women with anteflexure were sterile, a circumstance already referred to and

TABLE XXVII.—*Showing the Condition of Menstruation as to Regularity and Pain in all forms of Flexure.*

Under "fruitful" are included also all who had aborted or miscarried.	MENSTRUATION REGULAR FROM THE FIRST.								MENSTRUATION REGULAR AFTERWARDS.								MENSTRUATION NEVER REGULAR.								SUMMARY.						
	Unmarried.		Sterile.		Fruitful.		Total.		Unmarried.		Sterile.		Fruitful.		Total.		Unmarried.		Sterile.		Fruitful.		Total.		Unmarried.		Sterile.		Fruitful.		Total.
	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	
Flexures of the cervix.																															
With pain at the beginning of the flow	17	24.28	53	75.71	...	...	70	...	7	58.33	4	33.53	1	8.33	12	...	2	22.22	7	77.77	...	...	9	...	26	28.57	64	70.33	1	1.09	91
Percentage....	50.00	...	70.66	...	...	...	63.63	...	58.33	...	40.00	...	100.	...	52.17	...	28.37	...	58.33	...	...	...	47.36	...	49.05	...	65.77	...	50.00	...	59.86
With pain during the flow..............	4	36.36	7	63.33	...	...	11	...	...	...	2	100.	...	...	2	...	...	...	2	100.	...	...	2	...	4	26.66	11	73.33	1	...	15
Percentage....	11.76	...	9.33	...	...	...	10.00	...	...	...	20.00	...	...	...	8.69	...	...	...	16.66	...	...	...	10.52	...	7.54	...	11.34	...	50.00	...	9.86
Free from pain	13	44.82	15	51.72	1	3.44	29	...	5	55.55	4	44.44	...	...	9	...	5	62.50	3	37.50	...	...	8	...	23	50.00	22	49.27	...	...	46
Percentage....	38.23	...	20.00	...	100.	...	26.36	...	41.66	...	40.00	...	...	...	39.13	...	71.42	...	25.00	...	...	...	42.10	...	43.39	...	22.68	...	...	...	30.26
Total	31	30.90	75	68.18	1	.90	110	...	12	52.17	10	43.47	1	4.34	23	...	7	36.84	12	63.15	...	...	19	...	53	34.86	97	63.81	2	1.31	152
Percentage....	...	...	...	...	...	...	...	72.36	...	...	...	...	...	...	...	15.13	...	...	...	...	...	...	...	12.50							
Anteflexures.																															
With pain at the beginning of the flow	...	...	...	...	2	100.	2	...	...	...	...	...	1	100.	1	...	...	...	1	100.	...	...	1	...	...	...	1	25.00	3	75.00	4
Percentage....	...	...	...	...	8.00	...	3.44	...	...	...	...	...	25.00	...	5.26	...	...	...	33.33	...	...	...	12.50	...	...	...	25.64	...	9.37	...	4.70
With pain during the flow..............	6	20.68	17	58.62	6	20.69	29	...	6	54.54	4	36.36	1	9.09	11	...	2	50.00	1	25.00	1	25.00	4	...	14	31.81	22	50.00	8	18.18	41
Percentage....	100.	...	62.96	...	24.00	...	50.00	...	100.	...	44.44	...	25.00	...	57.89	...	100.	...	33.33	...	33.33	...	50.00	...	100.	...	58.97	...	25.00	...	51.76
Free from pain.......	...	...	10	37.03	17	62.96	27	...	...	...	5	71.42	2	28.57	7	...	...	...	1	33.33	2	66.66	3	...	...	...	16	43.30	21	56.75	37
Percentage....	...	...	37.03	...	68.00	...	46.55	...	...	...	55.55	...	50.00	...	36.84	...	...	...	33.33	...	66.66	...	37.50	...	...	...	41.02	...	65.62	...	43.52
Total	6	10.34	27	46.55	25	43.10	58	...	6	31.57	9	47.36	4	21.05	19	...	2	25.00	3	37.50	3	37.50	8	...	14	16.27	39	46.51	32	[illegible]	85
Percentage....	...	...	...	...	...	...	...	68.23	...	...	...	...	...	...	...	22.35	...	...	...	...	...	...	...	9.41							

TABLE XXVII.—*Continued.*

Retroflexures.	With pain at the beginning of the flow	...	...	1	50.00	1	50.00	2	...	...	...	1	100.	...		1	...	1	100.	...	...	...	...	1	...	1	25.00	2	50.00	1	25.00	4
	Percentage	...	...	14.28	...	8.33	...	8.33	...	...		100.	...	...		33.33	...	100.		...	...		...	100.	...	16.66	...	22.22	...	7.69	...	14.28
	With pain during the flow	2	40.00	3	60.00	...	...	5	...	...		...	...	1	100.	1	...	...		...	...		...	...	...	2	33.33	3	50.00	1	16.66	6
	Percentage	40.00	...	42.85	...	...	...	20.83	...	...		...	...	100.		33.33	...	...		...	...		...	...	...	33.33	...	33.33	...	7.69	...	21.42
	Free from pain	3	17.64	3	17.64	11	64.71	17	...	...		1	100.	...		1	...	...		...	..		..	...	...	3	16.66	4	22.22	11	61.11	18
	Percentage	60.00	...	42.85	...	91.66	...	70.83	...	...		100.	...	...		33.33	...	...		...	...		...	...	...	50.00	...	44.44	...	84.60	...	64.28
	Total	5	20.83	7	29.16	12	50.0	24	...	...	...	2	66.66	1	33.33	3	...	1	100.	...	...	...	...	1	...	6	21.42	9	32.14	13	46.42	28
	Percentage	...	...	...	...	...	...	...	85.07	...	...	...	...	...	...	...	10.71	...	...	...	...	...	...	...	3.57	...	...	...	...	...	...	
Lateral flexures.	With pain at the beginning of the flow	1	14.28	5	71.42	1	14.28	7	...	...	...	...	...	...	...	...	...	...	...	2	100.	...	...	2	...	1	11.11	7	77.77	1	11.11	9
	Percentage	25.00	...	35.71	...	25.00	...	31.81	...	...	...	...	...	...	...	...	...	...	...	100.	...	...	...	50.00	...	25.00	...	38.88	...	14.27	...	31.03
	With pain during the flow	2	28.57	5	71.42	...	...	7	...	...	...	1	100.	...	...	1	...	...	...	...	...	...	...	...	...	2	25.00	6	75.00	...	...	8
	Percentage	50.00	...	35.71	...	...	...	31.81	...	...	...	50.00	...	...	...	33.33	...	...	...	...	...	...	...	...	...	50.00	...	33.33	...	...	...	27.58
	Free from pain	1	12.50	4	50.00	3	37.50	8	...	...	...	1	50.00	1	50.00	2	...	...	...	...	...	2	100.	2	...	1	8.33	5	41.66	6	50.00	12
	Percentage	25.00	...	28.57	...	75.00	...	36.36	...	...	...	50.00	...	100.	...	66.66	...	...	...	...	...	100.	...	50.00	...	25.00	...	27.77	...	85.71	...	41.37
	Total	4	18.18	14	63.63	4	18.18	22	...	...	...	2	66.66	1	33.33	3	...	...	...	2	50.00	2	50.00	4	...	4	13.79	18	62.06	7	24.13	29
	Percentage	...	...	...	...	...	...	...	78.86	...	...	...	...	...	...	...	10.34	...	...	...	...	...	...	...	13.79	...	...	...	...	...	...	

confirmed by the figures given in this table. With this form of flexure 4.70 per cent. had suffered from pain at the beginning of the flow, 51.76 per cent. during the flow, and 43.52 per cent. were free from pain. The number, however, who suffered from pain at the beginning is too small for the proportion to be accepted, without further observation, since it consisted of but one sterile and three fruitful women. These cases, it may be assumed, began menstrual life with flexures of the cervix, and the body of the uterus became involved afterwards. This table shows that all the unmarried, and the greater portion of the sterile, as well as of the fruitful women, suffered pain during the flow, which would indicate that this is the rule, while pain, at the beginning of the flow, is the exception, in anteflexures of the body.

The number of retroflexions is comparatively small, but the proportion is greatest among fruitful women; and absence from pain at the first menstrual period was the rule.

The greater proportion of those who suffered from lateral flexures were sterile, and over half the number had pain in after life, either in the beginning of or during the flow. But, of the total number, a larger percentage had been free from pain at the beginning of menstrual life than was shown to have been the case with either the unmarried, sterile, or fruitful women separately.

Table XXVIII. gives the average length of the menstrual flow, at puberty and in after life, for all conditions of uterine flexures. The average length of menstruation at puberty was 4.76 days in all cases of flexure of the cervix. But little variation existed in the average time between the unmarried and sterile. As there were but two women who were supposed to have been impregnated, all the comparisons made will be between the two other social conditions. The average length of flow was 4.80 days with those who were regular from the beginning; with those who were never regular, 4.33 days; while for those who became regular afterwards it varied but little from that found for the whole number. When there was pain, the flow was prolonged to 4.89 days, as compared with the 4.18 days for those who had no pain.

The average length of the menstrual flow in after life, for all cases of flexure of the cervix, was 4.62 days. The time became shortened with both the unmarried and sterile women, but more markedly so with the former.

The duration of flow, at the beginning of menstrual life, averaged 4.90 days for the total number of those who suffered from anteflexure, and there was but the slightest variation from this average for either social condition. Those who were regular from the first menstruated 4.97 days, and when regular afterwards, 5 days. As in flexures of the cervix, the same decrease in the average duration is to be noted for those who were never regular. When attended with pain, the length of flow was slightly increased above the average. Where pain occurred at the beginning of the flow the average duration was 4.89 days; with pain during the flow the time was increased to 4.97 days; while the average was 4.87 days for those who were free from pain. It will be shown by the next table that, in comparison with flexures of the cervix, the menstrual changes in after life, with anteversions, were more marked as to quantity than duration. The average on the total number is essentially the same in after life as that found for flexure of the cervix, with the same general diminution in the length of the period. This change is more marked with the sterile, suffering from anteflexures, while among the unmarried, with flexure of the cervix, the average length of the period was much shortened.

Women who suffered in after life from flexure of the uterine body backward averaged 5.02 days for the length of the first menstrual flow. Where they had been regular from the first the average was 5.12 days, and when regular afterwards it was found to be 4.75 days. For those who were never regular the number of retroflexions is too small to be noted, but the rule is for the flow under this condition to be much shorter than the general average. On the total number of all cases with retroflexion, the average length of the first menstrual flow among the unmarried was 3.66 days; for the sterile, 5.33 days; for the fruitful, 5.50 days. From some unknown cause, the average for the unmarried is far below that for either of the other conditions. Those who suffered pain only in the beginning of the flow averaged 5.25 days; when felt during the flow it was 5.33 days; and for those who had been free from pain the average was 4.09 days: thus showing, as in other cases of flexure, that the existence of pain is always accompanied by an increase in length of the menstrual flow. In after life the average length of flow for the unmarried was but 3.33 days; for the sterile, 4.55; and for the fruitful, 5.30 days; and for the total number, 4.64 days. It will be noticed that (from some accidental cause, it is supposed, as the number is so small) the length of flow for the unmarried continued in after life below the average of either the sterile or fruitful, although the difference was not so great as we have shown to exist at puberty.

The length of the menstrual flow in after life, for each social condition, became less than that existing at puberty. But the fact is a

Table XXVIII.—*Condition of Menstruation as to Regularity, Pain, and Length of Flow, at Puberty and in After-life.*

		Regular from the first.					Regular afterwards.					Never Regular.					Summary.				
		Unmarried.	Sterile.	Fruitful.	Total number.	General average.	Unmarried.	Sterile.	Fruitful.	Total number.	General average.	Unmarried.	Sterile.	Fruitful.	Total number.	General average.	Unmarried.	Sterile.	Fruitful.	Total number.	Av. length of flow.
Flexures of the cervix.	With pain at the beginning of the flow..	17	53	...	70	...	7	4	1	12	...	2	7	....	9	....	26	64	1	91	
	Average length of menstruation at Puberty	5.28	4.73	...	...	4.94	4.50	5.66	4.50	...	4.88	2.00	5.50	....	....	4.33	4.94	4.87	4.50	....	4.89
	Average length of menstruation at Afterwards	4.47	4.77	...	...	4.70	5.42	4.50	5.00	...	5.08	2.50	4.57	....	....	4.11	4.37	4.73	5.00	....	4.69
	With pain during the flow..............	4	7	...	11	...	...	2	...	2	...	....	2	....	2	....	4	11	....	15	
	Average length of menstruation at Puberty	4.92	4.83	...	...	4.82	...	4.60	...	...	4.60	....	3.00	....	....	3.00	4.92	4.45	....	....	4.54
	Average length of menstruation at Afterwards	5.50	5.00	...	...	5.18	...	5.50	...	...	5.50	....	2.50	....	....	2.50	5.50	5.54	....	....	4.20
	Free from pain..............................	13	15	1	29	...	5	4	...	9	...	5	3	....	8	....	23	22	1	46	
	Average length of menstruation at Puberty	3.00	4.50	...	...	4.12	...	4.33	...	...	4.33	....	....	....	....	....	3.00	4.44	....	....	4.18
	Average length of menstruation at Afterwards	2.50	4.80	4.00	...	4.41	3.40	4.00	...	...	3.66	5.40	5.00	....	....	5.25	5.17	4.68	5.00	....	4.41
	Total number of flexures of the cervix..	34	75	1	110	...	12	10	1	23	...	7	12	....	19	....	53	97	2	132	
	Average length of menstruation at Puberty	4.36	4.60	...	...	4.80	...	...	...	...	4.73	....	....	....	....	4.33	4.76	4.78	4.50	....	4.76
	Average length of menstruation at Afterwards	4.41	4.80	4.00	...	4.67	4.58	4.50	5.00	...	4.56	4.57	4.33	....	....	4.42	4.47	4.71	4.50	....	4.62
Anteflexures of the body.	With pain at the beginning of the flow	...	...	2	2	...	...	...	1	1	...	....	1	....	1	....	....	1	3	4	
	Average length of menstruation at Puberty	4.92	4.83	4.00	...	4.00	5.50	5.80	5.50	...	5.50	5.25	2.00	....	....	2.00	5.00	4.89	4.33	....	4.89
	Average length of menstruation at Afterwards	...	...	5.50	...	5.50	...	...	3.00	...	3.00	....	1.00	....	....	1.00	....	1.00	4.66	....	3.75
	With pain during the flow.............	6	17	6	29	...	6	4	1	11	...	2	1	1	4	....	14	22	8	44	
	Average length of menstruation at Puberty	6.00	5.06	4.50	...	5.26	4.66	4.60	7.00	...	4.88	4.00	4.66	3.00	....	4.14	5.16	4.91	4.75	....	4.97
	Average length of menstruation at Afterwards	4.16	4.88	4.16	...	4.51	5.00	3.50	4.00	...	4.36	5.00	3.00	3.00	....	4.00	4.64	4.09	4.00	....	4.06
	Free from pain..............................	...	10	17	27	...	...	5	2	7	...	....	1	2	3	....	....	16	21	37	
	Average length of menstruation at Puberty	4.36	5.21	5.00	...	4.97	5.00	4.57	5.00	...	4.75	6.50	3.40	4.00	....	4.25	4.73	4.75	4.95	....	4.86
	Average length of menstruation at Afterwards	...	4.80	5.05	...	4.96	...	5.00	4.00	...	4.71	....	3.00	6.00	....	5.00	....	4.75	5.00	....	4.91
	Total number of anteflexures	6	27	25	58	...	6	9	4	19	...	2	3	3	8	....	14	39	32	81	
	Average length of menstruation at Puberty	4.93	5.02	4.86	...	4.97	4.71	4.94	5.50	...	5.00	5.11	4.58	3.50	....	4.90	4.93	4.81	4.85	....	4.90
	Average length of menstruation at Afterwards	4.16	4.85	4.88	...	4.79	5.00	4.33	3.75	...	4.42	5.00	2.33	5.00	....	4.00	4.64	4.33	4.73	....	4.63

TABLE XXVIII.—*Continued.*

Retroflexures of the body.	With pain at the beginning of the flow		...	1	1	2	...	...	1	...	1	...	1	....	....	1	....	1	2	1	4	
	Average length of	Puberty	...	6.00	7.00	...	6.33	...	...	...	...	...	2.00	....	....	....	2.00	2.00	6.00	7.00	....	5.25
	menstruation at	Afterwards	...	7.00	5.00	...	6.00	...	1.00	...	...	1.00	5.00	....	....	....	5.00	5.00	4.00	5.00	....	4.50
	With pain during the flow		2	3	...	5	...	...	...	1	1	...	....	....	....	....	....	2	3	1	6	
	Average length of	Puberty	4.50	4.49	...	...	4.50	...	...	5.00	...	5.00	....	....	....	....	....	4.50	4.49	7.00	....	5.33
	menstruation at	Afterwards	3.00	3.33	...	...	3.20	...	...	7.00	...	7.00	....	....	....	....	....	3.00	3.33	7.00	....	3.83
	Free from pain		3	3	11	17	...	...	1	...	1	...	....	....	....	....	....	3	4	11	18	
	Average length of	Puberty	3.63	5.33	5.45	...	5.03	...	4.00	4.00	...	4.00	....	....	....	....	....	3.66	5.14	5.33	....	4.90
	menstruation at	Afterwards	3.00	6.00	5.18	...	4.91	...	5.00	...	...	5.00	....	....	....	....	....	3.00	5.75	5.18	....	4.94
	Total number of retroflexures		5	7	12	21	...	...	2	1	3	...	1	....	....	1	....	6	9	13	28	
	Average length of	Puberty	3.87	5.50	5.52	...	5.12	...	4.00	5.00	..	4.75	2.00	....	....	....	2.00	3.66	5.33	5.50	....	5.02
	menstruation at	Afterwards	3.00	5.00	5.16	...	4.66	...	3.00	7.00	...	4.33	5.00	....	....	....	5.00	3.33	4.55	5.30	....	4.64
Lateral flexures of the body.	With pain at the beginning of the flow		1	5	1	7	...	...	...	...	...	...	....	2	....	2	....	1	7	1	9	
	Average length of	Puberty	7.00	3.66	7.00	...	5.00	...	...	...	...	...	2.00	....	....	....	2.00	7.00	3.66	7.00	....	5.00
	menstruation at	Afterwards	7.00	4.20	6.00	...	4.85	...	...	...	...	...	....	3.50	....	....	3.50	7.00	4.00	6.00	....	4.55
	With pain during the flow		2	5	...	7	...	...	1	...	1	...	....	....	....	....	....	2	6	....	8	
	Average length of	Puberty	6.00	4.50	...	...	5.25	...	...	...	...	...	2.00	....	....	....	2.00	4.63	4.50	....	....	4.60
	menstruation at	Afterwards	5.00	5.20	...	...	5.14	...	3.00	...	...	3.00	....	....	....	....	....	5.00	4.83	....	....	4.87
	Free from pain		1	4	3	8	...	...	1	1	2	...	....	....	2	2	....	1	5	6	12	
	Average length of	Puberty	5.25	3.75	5.00	...	4.75	...	5.50	2.00	...	4.33	....	....	....	....	....	5.25	4.33	4.25	....	4.57
	menstruation at	Afterwards	10.00	5.00	4.00	...	5.25	...	4.00	3.00	...	3.50	....	....	7.50	....	7.50	10.00	4.80	5.00	....	5.33
	Total number of lateral flexures		4	14	4	22	...	...	2	1	3	...	....	2	2	4	....	4	18	7	29	
	Average length of	Puberty	5.71	3.88	5.50	...	4.86	...	5.50	2.00	...	4.33	2.00	....	....	....	3.08	4.59	5.00	4.60	....	4.58
	menstruation at	Afterwards	6.75	4.78	4.50	...	5.09	...	3.50	3.00	...	3.33	....	3.50	7.50	....	5.50	6.75	4.50	5.14	....	4.96

remarkable one, that the average duration in after life should essentially the same for flexures of the cervix as for those of the bod either forward or backward.

The average length at puberty, on all cases of lateral flexures, w [illegible] days, and was essentially the same for the unmarried, sterile, a fruitful women. In after life the flow for the unmarried was increas [illegible] days; for the sterile it became lessened, and again increas with the fruitful women.

If the general averages as given in Table X. page 167, under t head of menstruation, be accepted as standards, it will be seen, th under all conditions, both at puberty and in after life, the length menstruation is much less for those who have flexures of the cerv [illegible] rule, the contrary is the case for flexures of the uterine bod [illegible] the averages at puberty are much higher than the general on and in after life the difference is not so great.

In this connection the fact must not be forgotten that the durati [illegible] the menstrual flow is always lessened in proportion to the amo [illegible] suffered. This has its bearing, in indicating the existence [illegible] the cervix at the time of puberty, and, if accepted, it is [illegible] importance to prove that those of the body are formed in af [illegible]. The changes in menstruation after puberty, when flexures ha [illegible], are presented in Table XXIX. These are treated of und [illegible] as regards the length of flow. In the first two divisio are grouped those in whom no change in the length of the peri [illegible] although the quantity became altered in those of the secon [illegible] became shorter for those forming the third, and lengt [illegible] those in the fourth division; while in both sections t [illegible] had undergone some change. Menstruation remained u [illegible] every respect, from what it was at the beginning, in 47. [illegible] cases with flexure of the cervix. Thus there we [illegible] where the flow was normal as to quantity, with an avera [illegible] duration. Twelve cases were always too free, as th [illegible] the beginning, but the time remained unchanged, a [illegible] days, while with sixteen other cases the flow was alwa [illegible] but 3.12 days. In this group of cases, where [illegible] in after life, the average length of normal menstru [illegible] was 4.40 days, and for the sterile, 4.85 day [illegible] or 28.94 per cent., forming the second grou [illegible] the same as at the beginning, but the quantity b [illegible] lessened, or irregular in after life. The ave [illegible] for this class, it will be seen, was 4.23 days.

We find this result, that of the whole number of flexures of the cervix, 76.18 per cent., consisting of the first and second groups, remained in after life the same as to the length of menstruation, but with a certain number of cases the quantity became changed. The third group, consisting of 17 cases, or 11.11 per cent. of the whole, was formed of those with whom the duration of the period became lengthened, while the quantity either increased or lessened. The average duration of the whole group in after life was 6.23 days. The fourth group consists of 19 cases, or 12.50 per cent. of the whole, in which the time became shorter in after life, and the quantity was also changed. The average length of the period was 3.26 days for this group.

It is shown by Table XXIX. that with only 11 cases of anteversion, or 12.94 per cent., forming the first group, the menstrual flow remained unchanged in after life. But if the second group be included with the first, it will be found that with 51 cases, or 60 per cent., the length of flow remained unchanged after puberty. Table XXX., as a summary of Table XXIX., demonstrates that the changes in quantity are more marked with anteflexion than with any other form of flexure. It is shown that with nearly one-half of all the cases of anteflexion the period becomes lessened. This proportion would be even greater at a later period of life, since the rule is that the flow is at first increased in quantity but afterwards becomes less. A further consideration of these tables would present but little additional interest to the general reader, but the student will find many suggestive points, for the elucidation of which additional observations might be profitably undertaken.

The time of marriage seems to have had but little bearing on either class of flexures, or, at least, none where there existed flexure of the cervix. The chief point of note is the fact that the average age of marriage was a little later than the general one. Either extreme of age, however, may have had an indirect bearing. For instance, the average age of marriage among the sterile women with lateral flexures, was 19.20 years, and for those women who had been impregnated it was 25.75 years. Among those who had been sterile, there were seventeen flexures to the left, and the average age of marriage, as shown in Table XXV. page 328, for these women was 17.11 years. This is the lowest average of any one class, yet a high one, since several women were somewhat advanced in life on the one hand, and on the other, the greater number were much below the average given, one having been married at fourteen years of age. In eight of these

TABLE XXIX.—*Showing the Length and Changes of Menstruation in after-life, with Flexures of the Uterus.*

			LENGTH AND QUANTITY OF FLOW REMAINED UNCHANGED, BEING FROM THE BEGINNING								LENGTH OF FLOW REMAINED UNCHANGED, BUT THE QUANTITY BECAME AFTERWARDS EITHER								LENGTH OF FLOW INCREASED, WITH THE QUANTITY EITHER								LENGTH OF FLOW LESSENED, WITH THE QUANTITY EITHER								SUMMARY.	
			Normal.		Too free.		Scanty.		Total.		Increased.		Lessened.		Irregular.		Total.		Increased.		Lessened.		Irregular.		Total.		Lessened.		Increased.		Irregular.		Total.			
			No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.
Flexures of the cervix.	Single.	No. of cases....	15	..	4	..	3	..	22	..	3	..	11	..	1	..	15	..	5	..	1	..	...	..	6	..	10	..	...	..	...	..	10	..	53	
		Average length of menstruation	...	5.40	...	7.00	...	2.00	...	5.22	...	5.66	...	3.35	...	5.00	...	3.93	...	6.20	...	5.00	...	..	...	..	...	2.70	...	..	...	..	...	2.70	..	4.47
		Percentage ..	34.09	..	33.33	..	18.75	..	...	..	23.07	..	42.30	..	20.00	..	...	..	31.35	..	100.	..	...	..	...	..	55.55	..	...	..	...	..	...	..		
	Sterile.	No. of cases....	28	..	8	..	13	..	49	..	10	..	15	..	4	..	29	..	11	..	...	..	...	..	11	..	7	..	...	..	1	..	8	..	97	
		Average length of menstruation	...	4.85	...	6.12	...	3.38	...	4.67	...	4.30	...	4.66	...	3.50	...	4.37	...	6.33	...	..	...	..	...	6.33	...	3.85	...	..	...	4.00	...	3.87	..	4.71
		Percentage ..	63.83	..	66.66	..	81.35	..	...	..	76.02	..	57.69	..	80.00	..	...	..	58.75	..	...	..	...	..	...	..	38.88	..	...	..	100.	..	...	..		
	Fruitful.	No. of cases....	1	..	...	..	...	..	1	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	1	..	...	..	...	..	1	..	2	
		Average length of menstruation	..	5.00	...	..	...	..	...	5.00	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	4.00	...	..	...	..	...	4.00	..	4.50
		Percentage ..	2.27	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	5.55	..	...	..	...	..	...	..		
		Total	44	5.04	12	6.41	16	3.12	72	4.84	13	4.61	26	4.11	5	3.80	44	4.23	16	6.31	1	5.00	...	..	17	6.23	18	3.22	...	..	1	4.00	19	3.26	152	4.62
		Percentage ..	61.11	..	16.66	..	22.22	..	47.37	..	29.54	..	59.09	..	11.36	..	28.94	..	94.11	..	5.88	..	...	..	11.11	..	94.73	..	...	..	5.26	..	12.50	..	..	

TABLE XXIX.—*Continued.*

Anteflexures. Unmar. No. of cases....	3	..	1	..	...	..	4	..	2	..	5	..	1	..	8	..	...	..	...	..	...	..	...	..	2	..	...	..	...	..	2	..	14	
Average length of menstruation	...	6.00	...	5.00	...	..	...	5.75	...	4.00	...	5.00	...	5.00	...	4.75	...	..	...	..	...	..	...	..	...	2.00	...	..	...	..	...	2.00	..	4.64
Percentage ..	37.50	..	50.00	..	...	..	...	..	14.28	..	21.73	..	33.33	..	...	..	...	..	...	..	...	..	...	..	12.50	..	...	..	...	..	...	..	..	
Sterile. No. of cases....	...	..	...	..	...	..	...	..	7	..	11	..	1	..	19	..	6	..	1	..	2	..	9	..	9	..	1	..	1	..	11	..	39	
Average length of menstruation	...	..	...	..	...	..	...	..	...	5.28	...	5.00	...	3.00	..	5.00	..	5.33	...	7.00	...	4.00	...	5.22	...	3.00	...	4.00	...	4.00	...	3.18	..	4.53
Percentage ..	...	..	...	..	...	..	...	..	50.00	..	47.82	..	33.33	..	...	..	66.66	..	33.33	..	100.	..	...	..	8.25	..	100.	..	...	..	...	..		
Fruitful. No. of cases....	5	..	1	..	1	..	7	..	5	..	7	..	1	..	13	..	3	..	2	..	...	..	5	..	5	..	...	..	2	..	7	..	32	
Average length of menstruation	...	4.60	...	4.00	...	3.00	...	4.28	...	4.60	...	3.57	...	3.00	...	3.92	...	8.66	...	7.00	...	..	...	8.00	...	3.80	...	..	...	6.00	...	4.42	..	4.75
Percentage ..	67.30	..	50.00	..	100.	..	...	..	35.71	..	30.43	..	33.33	..	...	..	33.3	..	66.66	..	...	..	...	..	31.25	..	...	..	...	..	...	..		
Total	8	5.12	2	4.50	1	3.00	11	4.81	14	4.85	23	4.37	3	3.66	40	4.48	9	6.44	3	7.00	2	4.00	14	6.21	16	3.12	1	4.00	3	8.0	20	3.50	85	4.63
Percentage ..	72.72	..	18.17	..	9.09	..	12.94	..	35.00	..	57.50	..	7.50	..	47.05	..	64.28	..	21.42	..	14.28	..	16.47	..	80.00	..	5.00	..	15.0	..	23.53	..	..	
Retroflexures. Unmar. No. of cases....	2	..	1	..	...	..	3	..	1	..	2	..	...	..	3	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	6	
Average length of menstruation	...	3.00	...	5.0	...	..	...	3.66	...	4.00	...	2.50	...	..	...	3.00	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	..	3.33
Percentage ..	25.00	..	100.	..	...	..	...	..	20.00	..	40.00	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..		
Sterile. No. of cases....	2	..	...	..	...	..	2	..	...	..	2	..	...	..	2	..	1	..	...	..	...	..	...	..	4	..	...	..	...	..	4	..	9	
Average length of menstruation	...	6.00	...	..	...	..	...	6.00	...	..	...	6.00	...	..	...	6.00	...	9.00	...	..	...	..	...	..	...	2.00	...	..	...	..	...	2.00	..	4.55
Percentage ..	25.00	..	...	..	...	..	...	..	...	..	40.00	..	...	..	...	..	100.	..	...	..	...	..	...	..	80.00	..	...	..	...	..	...	..		
Fruitful. No. of cases....	4	..	...	..	1	..	5	..	4	..	1	..	1	..	6	..	...	..	...	..	...	..	...	..	1	..	1	..	...	..	2	..	13	
Average length of menstruation	...	4.75	...	..	...	5.00	...	4.80	...	5.75	...	5.00	...	4.00	...	5.33	...	..	...	..	...	..	...	..	...	7.00	...	6.00	...	..	...	6.50	..	5.30
Percentage ..	50.00	..	...	..	100.	..	...	..	80.00	..	20.00	..	100.	..	...	..	...	..	...	..	...	..	...	..	20.00	..	100.	..	...	..	...	..		
Total	8	4.62	1	5.00	1	5.00	10	4.70	5	5.40	5	4.40	1	4.00	11	4.81	1	9.00	...	..	...	..	1	9	5	3.00	1	6.00	...	..	6	3.50	28	4.64
Percentage ..	80.00	..	10.00	..	10.00	..	35.70	..	45.45	..	45.45	..	9.09	..	39.28	..	100.	..	...	..	...	..	3.57	..	83.33	..	16.66	..	...	..	21.42	..	..	
Lateral flexures. Unmarried	1	5.00	1	7.00	...	..	2	..	1	5.00	...	..	...	..	...	..	1	10.	...	..	...	..	...	..	...	..	...	..	...	..	...	..	4	6.75
Sterile	7	5.00	...	..	4	2.50	11	..	1	5.00	1	5.00	...	..	...	..	2	7.50	...	..	...	..	...	..	3	3.33	...	..	...	..	...	..	18	4.50
Fruitful..........	...	..	1	10.	2	4.00	3	..	2	5.50	1	4.00	...	..	...	..	...	..	...	..	...	..	...	..	1	3.00	...	..	...	..	...	..	7	5.50
Total	8	5.00	2	8.50	6	3.16	16	4.12	4	5.25	2	4.50	...	..	6	5.00	3	8.33	...	..	...	..	3	8.33	4	3.25	...	..	...	..	4	3.25	29	4.96

TABLE XXX.—*The Condition of Menstruation at Puberty, and after Changes in Duration and Quantity, in Flexures of the Uterus.*

		Period unchanged as to time and quantity, being from the beginning			Length of period unchanged, but the quantity became either			Menstruation remaining unchanged in time.			Length of period increased, with the quantity either			Length of period lessened, with the quantity either			Menstruation changed in both time and quantity.			Summary.		
		Normal.	Too free.	Scanty.	Increased.	Lessened.	Irregular.	Number of cases.	Average length of period.	Per cent. for each condition.	Increased.	Lessened.	Irregular.	Lessened.	Increased.	Irregular.	Number of cases.	Average length of period.	Per cent. for each condition.	Total number of cases.	Average length of period on all conditions.	Per cent. for each condition.
Of the cervix.	Normal	44	....	....	....	....	....	44	5.04	37.93	....	....	....	....	....	....	....	....	....	44	5.04	28.94
	Scanty	....	....	16	....	....	....	16	3.12	13.79	....	....	....	....	....	....	....	....	....	16	3.12	10.52
	Too free or increased	....	12	....	13	....	....	25	5.48	21.55	16	....	....	....	....	....	16	6.31	41.44	41	5 80	26.97
	Lessened	....	....	....	....	26	....	23	4.11	22.41	....	1	....	18	....	1	19	3.31	52.77	45	3.72	29.60
	Irregular	....	....	....	....	....	5	5	3.80	4.31	....	....	....	....	....	....	1	4.00	2.77	6	3.83	3.94
	Total	....	....	....	....	....	....	116	4.61	....	....	....	....	....	....	....	36	4.66	....	152	4.62	
	Percentage on each condition	28.94	7.89	10.52	8.55	17.10	3.28	....	....	....	10.52	.65	....	11.84	....	.65						
Anteflexures.	Normal	8	....	....	....	....	....	8	5.12	15.68	....	....	....	....	....	....	....	....	....	8	5.12	9.41
	Scanty	....	....	1	....	....	....	1	3.00	1.96	....	....	....	....	....	....	....	....	....	1	3.00	1.17
	Too free or increased	....	2	....	14	....	....	16	4.81	31.37	9	....	....	....	1	....	10	6.20	29.41	26	5.34	30.58
	Lessened	....	....	....	....	23	....	23	5.56	45.09	....	3	....	16	....	....	19	3.73	55 88	42	4.19	49.41
	Irregular	....	....	....	....	....	3	3	3.66	5.88	....	....	2	....	....	3	5	4.80	14.70	8	4.37	9.41
	Total	....	....	....	....	....	....	51	4.64	....	....	....	....	....	....	....	34	4.61	....	85	4.63	
	Percentage on each condition	9.41	2.35	1.17	16.45	27.05	2.52	....	....	....	10.37	3.52	2.35	18.82	1.17	3.52						
Retroflexures.	Normal	8	....	....	....	....	....	8	4.62	38.09	....	....	....	....	....	....	....	....	....	8	4.62	28.57
	Scanty	....	....	1	....	....	....	1	5.00	4.76	....	....	....	....	....	....	....	....	....	1	5.00	3.57
	Too free or increased	....	1	....	5	....	....	6	5.33	28.57	1	....	....	....	1	....	2	7.50	28.57	8	5.87	28.57
	Lessened	....	....	....	....	5	....	5	4.44	23.80	....	....	....	5	....	....	5	3.00	71.42	10	3.70	35.71
	Irregular	....	....	....	....	....	1	1	4.00	4.76	..	....	....	....	....	....	....	....	....	1	4.00	3.57
	Total	....	....	....	....	....	....	21	4.76	....	....	....	....	....	....	....	7	4.28	....	28	4.64	
	Percentage on each condition	28.57	3.57	3.57	17.85	17.85	3.57	....	....	....	3.57	....	....	17.85	3.57							
Flexures.	Normal	8	....	....	....	....	....	8	5.00	36.36	....	....	....	....	....	....	....	....	....	8	5.00	27.58
	Scanty	....	....	6	....	....	....	6	3.16	27.27	....	....	....	....	....	....	....	....	....	6	3.16	20.68
	Too free or increased	....	2	....	4	....	....	6	6.33	27.27	3	....	....	....	....	....	3	8.33	42.85	9	7.00	31.03
	Lessened	....	....	....	....	2	....	2	4.50	9.09	....	....	....	4	....	....	4	3.25	57.14	6	3.66	20.68
	Irregular	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....						

cases evidence of previous cellulitis was detected, a condition very frequently found with lateral flexures. The highest average age of marriage for any particular class was found in those who had gone to full term, generally but once, and had had miscarriage frequently afterwards. Seven of these had anteversions; three, retroflexions; and six, lateral flexures to the left. The average age of marriage for these cases was 28.43 years, and this comparatively advanced age was doubtless an exciting cause of miscarriage and its consequences.

The average age at time of the first examination, for all cases of flexure of the cervix, was 24.80. For the unmarried it was 23.42 years; for the sterile, 25.02 years. The duration of the sterility was 3.21 years. There were but two cases of supposed pregnancy in which miscarriage had taken place at an average of 8.50 years previous to the first examination.

The average age of those with flexures of the body forward was 27.94 years. The unmarried averaged 23.97 years; the sterile, 28.78 years, and the fruitful, 31.28 years. The average length of time since marriage was, for the sterile, 7.61 years; and since the last pregnancy, for those who had borne children it was 7.63 years; for those who had only miscarried, 6.20 years; in two cases, due to criminal abortion, four years had elapsed.

The age of those suffering from retroflexion averaged 30.68 years; of the unmarried 29.22 years; of the sterile 24.25 years; and of the fruitful 34 years. The average length of time since marriage was 3.44 years in the sterile; since the last impregnation, for those who had gone to full term, 7.46 years; for those who had miscarried 5.83 years; and after one case of criminal abortion it was five years.

The average age of first examination, for the total number with lateral flexure, was 31.37 years; that for the unmarried being 33.50 years; for the sterile 30 years; and for the fruitful 31.40 years. The time since marriage, for the sterile, was 6.86 years; one woman had gone to full term and remained sterile 13 years. In those who had miscarried 5.66 years, on an average, had elapsed, and in one case of criminal abortion, the woman had not been again impregnated during five years.

With all flexures of the body the average age at the time of first examination was 25.88 years for the unmarried; for the sterile, 28.57 years; and for the fruitful, 32.35 years.

It is a remarkable fact, that the average age at which relief was sought should bear a direct proportion to the frequency of the form of flexure. This would indicate, if no other proof existed, that flexure of the cervix was a condition of puberty and early life, since re sought at the earliest age; that anteflexures follow soon after, retroflexures and the lateral ones, being less common and fo about the same proportion, are developed in later life.

As forming a part of the history of flexures it will be of inte record the supposed causes of disease as given by the patients selves. In 22 sterile women, with flexure of the cervix, who ha menced their menstrual life free from pain, five cases are recor having suffered sooner or later after marriage, from dysmenc during the flow. The same result followed in one case from ex to cold, in another instance from the use of a sewing machine, a of the fruitful had been well until the time of her supposed riage. Among the unmarried, 23 cases had been free from the beginning, and attributed their dysmenorrhœa in after life, instances, to the effects of cold; in two to over-study while at a ing-school; and another considered it the result of a fall.

All of these cases, when first seen, had, in addition to the fle the cervix, hypertrophy, and more or less disease of the bod some degree of flexure also above the vaginal junction. This leave thirty-three cases, or over two-thirds, who were free fro in after life, too small a number to be of great statistical value, will serve as an indication of the fact that a certain proportion ures of the cervix are unattended by dysmenorrhœa during aft unless other disease be superadded.

Of eighty-five patients who suffered from anteflexures, six attributed the origin or aggravation of their dysmenorrhœa, following causes: Eighteen sterile women suffered after marriag venereal excess, and eight from the effects of cold. Twent fruitful women, the total number of those who had been free fro or at least had suffered only at the beginning of the flow, suffere the following causes: Five from natural labor, two from tediou and one from instrumental delivery; twelve had miscarried, tw the victims of criminal abortion, two were worse after falls, a from fright. Seven unmarried women took cold and suppres menstrual flow, three were taken sick from over-study at bo school, three suffered from falls, and one from dancing at the the period.

Had it been possible to have obtained the facts, I am satisfi the unknown causes of anteflexure among the sterile and a of the fruitful women might have been found in the means ta prevent conception in early married life by the sterile, and by who had already borne children; some, doubtless, were the result of ill-assorted marriages, and mental disquietude, from which the nervous system may readily become involved, with an impairment of local nutrition through the medium of the sympathetic.

Of those with retroversion, five sterile women, who had been in previous good health, grew steadily worse after marriage; one suffered from exposure to cold, two were taken sick at boarding-school, and for the one remaining there was no cause of disease known. All the fruitful women, with retroflexion afterwards, were the worse for impregnation. Five were sick after childbirth, seven after miscarriage, and one after the production of a criminal abortion. An attack of cellulitis followed childbirth in three cases, and in each instance after the miscarriage and abortion. One unmarried woman was taken sick at boarding school, another from exposure to cold, and two cases suffered after falls. Thus the supposed causes of retroversion in all but three cases have been given. Three sterile women with lateral flexures became sick immediately after marriage; one fruitful woman after childbirth, three after miscarriages, and one after a criminal abortion. One unmarried woman suffered from exposure to cold.

Flexures of the cervix have their origin about puberty, or shortly afterwards, by the balance being lost between the relative growth of the body and cervix. From the earliest development of the uterus, as a rule, until pregnancy, some degree of anteversion exists. With the uterus in this position, the neck cannot be developed to its full length without forcing the cervix forward in the axis of the vagina, in the direction offering the least resistance. As the body of the uterus lies forward, the cervix must become bent upon itself at or near the vaginal junction, and thus the flexure is formed. This must take place, as has already been stated in a previous chapter, or the uterus will become retroverted, the result being determined by the fulness or absence of the posterior cul-de-sac of the vagina. When the cervix is small enough in diameter to be readily bent upon itself, the flexure is formed, but if the contrary be the condition, and the cul-de-sac be small, retroversion of the organ will occur. As the growth is not always completed at the time of the first menstrual period, a woman may begin with flexure of the cervix, and afterwards, from retroversion have retroflexion. With flexure of the cervix, the neck always becomes longer in after life than it was at puberty, as a consequence of being crowded forward in the vagina, and such a condition will then frequently produce retroversion.

With this form of flexure, the rule is, as regards pain, that it exists prior to the appearance of the flow and then ceases, or, at any rate, becomes much less. If the degree of flexure is slight, there may be an absence of pain, with as little feeling of discomfort as any female may experience at such a time, or the pain may not come on until after the flow has become fully established. When pain occurs in early menstrual life, and lasts through the flow, with or without a flexure of the cervix, a condition of the circulation already exists in the body of the uterus which later is likely to give trouble and to result in anteflexure.

From the congestion attending menstruation, the flaccid and elongated cervix becomes thickened and shortened, so that the uterine canal is then made nearly straight, with the cervix strong enough to resist the pressure of the posterior wall of the vagina. Therefore, the dysmenorrhœa existing just at the beginning is relieved, and, if the flexure be not very marked, impregnation frequently takes place shortly after marriage. But the chances of impregnation are lessened rapidly after the first year of married life, since disease of the uterine body and ovarian irritation are likely, in time, to be established as Nature's protest against the childless condition of the married female.

We have no other condition where menstruation, being painful at the beginning, is relieved so promptly when the flow becomes established. This symptom may be regarded as characteristic of a simple uncomplicated flexure of the cervix. It has been shown that 8.52 per cent. of twelve hundred and thirty-one fruitful women suffered in early life from pain at the beginning of the flow. This percentage may be assumed as the one in which impregnation is likely to have taken place with flexures of the cervix. We have no other means of arriving at any conclusion on this point, since a flexure of the cervix, in my experience, is never found after a female has gone to full term. I have observed hypertrophy and anteflexure of the uterine body to come on in after life, from some exciting cause, when the flexure of the cervix would gradually disappear as this later condition became established. This new morbid state completed, the sterility would continue, since there was then a greater bar to impregnation than previously. In some cases, when the disease of the body did not become quite so extensive, a degree of flexure would still remain in the cervix. Menstruation, in this condition, would then not only be painful before the flow came on, but would continue so throughout, and, if a sufficient amount of ovarian disturbance had been set up, the pain would be even more severe after the flow had ceased.

If we are able to draw any deduction from the analytical history of anteflexures which has been furnished, it is unequivocally to the effect that this condition has its origin after puberty, and observation indicates it to be the result of obstructed circulation from impaired nutrition. Painful menstruation during the flow may occur under other conditions, but it is never absent in any form of flexure of the uterine body, either forward, backward, or lateral. Whenever a female has been free from pain during menstruation in early life, and anteflexion has been discovered afterwards, it is my firm conviction that in such a case the uterus was in a normal condition at puberty. Where pain has occurred at this early period in the beginning of the flow, becoming intensified with its progress, and lasting until it has ceased, a flexure of the body has not existed necessarily, but a condition which engendered the flexure afterwards. With pain at this period of life, just at the commencement of the flow, and relieved when fully established, a condition exists which has been already explained.

Retroflexions are, I believe, deviations from a previously existing retroversion. While they are always aggravated by an obstructed circulation, as in the case of other flexures of the uterine body, the exciting cause is generally inflammatory action, not in the organ itself but in the connective tissue of the pelvis and ligaments of the uterus.

After a moment's consideration, it will be evident that the uterus may be retroverted to a point at which the broad ligaments, being already on the stretch, may, by inflammation, become shortened so as to produce the flexure. This action may be also aided, once shortening of the broad ligament exists, by inflammation in the utero-sacral ligaments. When a point in the version has been reached, at which the anterior wall of the vagina can no longer yield to the upward pressure of the cervix, any contraction of these ligaments will increase the degree of retroflexion. Since inflammation of the neighboring cellular tissue of the pelvis is, I believe, almost always, if not invariably, an accompaniment of retroflexion, these ligaments become necessarily more or less involved.

Before dismissing the subject of retroflexion, I must express the conviction that this lesion is by no means so commonly found as is generally supposed by the profession. Thickening on the posterior wall of the uterus from obstructed circulation in a case of retroversion is frequently mistaken for it. This condition is not necessarily accompanied by cellulitis, and disappears rapidly after the uterus has been

CHAPTER XVIII.

TREATMENT OF FLEXURES OF THE UTERUS.

Errors in pathology—Intra-uterine stem pessaries—Dilatation—Curved tents—Division of cervix.

It must be now evident, from what has already been stated in regard to the supposed causes of flexures, that no course of treatment can be adopted which would be generally applicable.

The sole cause of confusion which has existed hitherto in regard to the proper treatment originated in the error of attempting to treat the common symptom or result as the disease. The condition in common was the flexure, under which head have been placed effects produced by very different causes.

It has been clearly shown that not only must a wide distinction be drawn between a flexure of the cervix and one of the uterine body, but also between the different forms of the latter. In one condition, as has been shown, the exciting cause is a want of proper development, with a result which takes place mechanically, and produces, as a rule, no disturbance, except at the beginning of the menstrual period. The other condition, a flexure of the uterine body, is a result brought about by obstruction to the circulation, its site being determined, as it were, by accident, and it is frequently complicated by inflammation.

Much mischief has resulted during the past eighteen years from the want of accurate knowledge as to the true pathology of these cases. Should the views which are now being presented prove, on further investigation, incorrect, the error, at least as taught, will produce little harm. Since the practice of indiscriminate division of the cervix was first introduced by Prof. Simpson, more malpractice has been perpetuated throughout the world in the name of this simple operation, than from any other procedure known to the profession. For years past, the treatment of flexures has consisted in a resort to surgical means, to the use of the intra-uterine stems, or to frequent dilatation.

The intra-uterine stem and the practice of dilatation for the treatment of flexures might, with our present views of the pathology, be dismissed without further comment. But, unfortunately, members of the profession are frequently advocating the use of the stem pessary, regardless of the experience of those who have gone before them, until they in turn have to learn that they have not been the wiser in their day. As soon as the true condition comes to be appreciated, the use of the intra-uterine stem will be abandoned as a most irrational instrument. Experience will at last teach every one that no permanent benefit is ever derived from its use; that no degree of tolerance is ever established; but that sooner or later, in almost every case, mischief will result. I have long taught that its use in a flexure would be as irrational as the introduction of a straight steel sound into the urethra for the relief of an existing chordee; the penis might be straightened by force, but the cause of difficulty would certainly not be removed. Were we to straighten out a flexure of the cervix by means of an intra-uterine stem, the end of the instrument would make continued pressure on the posterior wall of the vagina on account of the want of necessary space in the canal. So much disturbance, in an American woman at least, would be excited in the vagina and uterus that inflammation would certainly become established if its use were persevered in. Then, as soon as the instrument is removed, the neck will return to its original condition.

If this instrument be employed with a flexure of the uterine body, the disturbance is likely to be even more marked. A condition here exists which so closely resembles an inflammatory one, that the slightest provocation is often sufficient to establish cellulitis and, even, general peritonitis. Whenever, by sanction of a merciful Providence, the stem has been tolerated for a time, even in this condition, no more progress will have been made towards removing the existing cause of the flexure than would be accomplished by the sound in a case of chordee. Moreover, were its use entirely successful, so far that the canal remained perfectly straight, and patulous afterwards, the cause of the flexure would remain, and the pain of menstruation would, in all probability, be increased in consequence of such disturbance.

The same objections are to be advanced against the practice of dilating with either steel sounds or the sponge tent, so far as they may be employed for the relief of a flexure of the uterine body. The use of the curved sponge tent, which I was accustomed to employ fifteen years ago to straighten a flexure, produced less irritation than the passage of a number of the steel dilators for the same purpose.

But the use of either is faulty in theory, and without permanent benefit, and the practice is always attended with risk.

There are certain forms or conditions of flexure, in which we must resort to surgical means for relief, and there are others in which it would be malpractice to employ them. It may be accepted as a truism, derived from experience, that, in flexure of the uterine body, no surgical procedure will be of the slightest use towards permanently removing the conditions; and that whenever practised, in the usual conditions, the life of the patient is thereby unnecessarily placed in jeopardy. The only exception to the rule is, when a flexure of the body forward has so long existed, that, from absorption of tissue at the angle, the condition has become a permanent deformity. In this state, after the proper preparatory treatment, as we shall see, an operation is sometimes advisable.

Quite different is the condition where the flexure is below the vaginal junction. The body of the uterus is then found, as a rule, in position at a right angle to a long and pointed neck which presents in the axis of the vagina. This lesion has been attributed to a fault in nutrition, and is one which only by accident is ever complicated by inflammatory action. Both dysmenorrhœa and sterility exist, as a rule, with this condition, but, as has been already shown, with little or no uterine disease until at a somewhat advanced period of married life. This is one of the commonest of the mechanical causes of sterility, and when surgical means can be applied at an early period, the result has proved, in my experience, very satisfactory in removing the sterility, and in affording relief to the painful menstruation. But these results are only gained, in so satisfactory a manner, in simple uncomplicated cases of flexure of the cervix, such as we find shortly after marriage, in early life, and before any form of uterine disease has supervened. Yet, in only a small percentage of flexures of the cervix are we justified in resorting to surgical means. It should never be performed on the unmarried woman, except in extreme cases of dysmenorrhœa, when the neck is unusually long. Yet, this is not to convey the impression that I am in favor of neglecting the treatment of an unmarried woman as such. A large proportion of these cases may become impregnated after marriage, notwithstanding the existence of flexure. I do not, therefore, advocate the operation if it can be avoided, and if there should be any prospect of marriage. The woman should receive the same local treatment as would be deemed applicable in any case where the degree of flexure was not sufficient to jusify an operation. For the sterile women, the operation should be performed after a reasonable delay, whenever the dysmenorrhœa is severe and has increased since marriage, but it will prove of little value for the relief of sterility if it has existed without painful menstruation. Whenever the cervix is of unusual length, the operation is necessary to remove a condition which, from sexual intercourse, is likely to result in retroversion. With this displacement, prolapse and increased elongation of the cervix afterwards take place, as the body of the uterus becomes forced over into the axis of the vagina.

The ultimate result of this operation is to bring the neck of the uterus to a more natural length, and it then becomes straighter, shorter, and thicker. This change in the neck is brought about, it is supposed, by the action of the longitudinal fibres, after the circular ones have been divided. The course of the muscular fibres of the cervix is not so well defined as in the body of the uterus, being more matted together; consequently, this explanation may not be accepted without question. But, of the result, there can exist no doubt. We will, therefore, leave the question to be determined by others, whether the result is produced by contraction of the cicatricial surfaces of the divided cervix, opposite the flexure, or by muscular action.

Sir James Y. Simpson first proposed and practised a lateral division of the cervix for overcoming a narrowing of the canal, and for opening the passage when encroached upon by a flexure. The results of this practice were not entirely satisfactory, when, about 1860, Dr. Sims's ingenuity suggested an incision of the posterior lip backward in the median line. After a few operations had been performed by him, he returned to the lateral method, and at the time of his leaving the country in 1862 that was his usual practice. While in Europe he seemed to have revived the original operation, and has recently resorted to it more frequently. But, as far as I have had the opportunity of judging, my impression is that the lateral operation, as a rule, is his usual practice. Having had the opportunity of observing the results of his practice more closely than he could himself, and also by watching my own, I became satisfied that neither mode of operating will relieve a flexure of the uterine body. As early as 1865, I placed on record the views I then held, and had already taught for several years previous. These views were nearly the same as I hold today, both in relation to the pathology and the treatment of flexures. I then wrote,[1] "I am satisfied that neither operation will permanently relieve any case, unless the flexure is confined to the neck, and is below the vaginal junction. While the backward operation, as proposed, would relieve a moderate flexure, the lateral one, even if extended on each side to the vaginal junction, could not accomplish so much, unless the posterior flap in the process of healing retracted sufficiently to clear the seat of stricture, which it could not do. The dysmenorrhœa invariably returns after a few months, so soon as the more revulsive effects of the operation have subsided." My views at that time were that a much larger proportion of flexures needed the operation, but more especially for the purpose of facilitating the application of after treatment to the canal. The additional experience of twelve or thirteen years has only confirmed my views the more in limiting the operation to a flexure of the cervix, with the single exception which has been cited.

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[1] "Treatment of Dysmenorrhœa and Sterility, resulting from Anteflexure of the Uterus." New York Medical Journal, June, 1865.

Were other advantages equal, the backward operation is preferable to the lateral one, since the cervix is divided only in one direction, and the risk from hemorrhage is less, as the circular artery can be easily avoided. Moreover, there will be no gaping or rolling out of the edges after they have healed, as the flaps will be kept sufficiently in contact by the lateral walls of the vagina. When we come to consider the effect of laceration of the cervix which occurs at childbirth, the bearing of this circumstance in relation to the eversion of the flaps will be better appreciated. Another objection, and in fact the most important one, to be urged against the lateral operation, is the greater liability to the occurrence of cellulitis after it. In the lateral operation the cervix is divided on both sides, consequently it might be justly claimed that the risk was at least twice as great as when it is simply incised backwards. But the danger from the lateral operation is still further greatly enhanced by the fact that, when the cervix is divided laterally to the vaginal junction, the incisions go down to, and frequently into, the cellular tissue of the pelvis inclosed on each side between the folds of the broad ligament. These incisions are thus made in close proximity to immense plexuses of veins and venous sinuses in the uterus itself, which are more numerous nearer to the lateral surfaces, so that these may become readily involved by any local inflammation. In the backward operation, it is never well to extend the incision to the vaginal junction, although there really exists but little cellular tissue in this neighborhood likely to become involved.

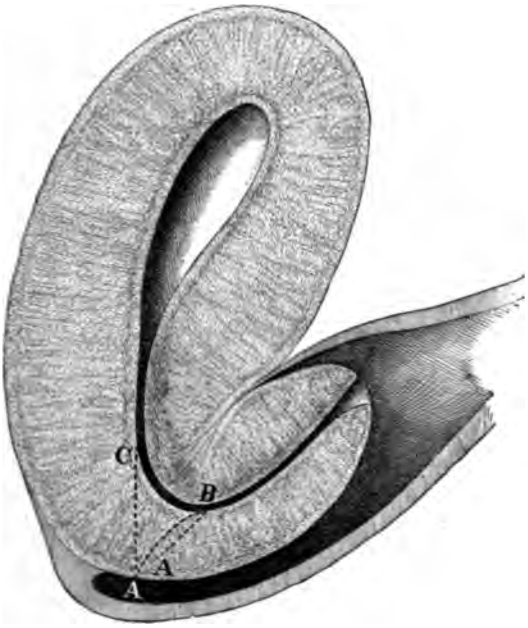
The operation is now generally performed with either the knife or scissors. Simpson's uterotome was first employed, but there were so many objections to it that Dr. Sims devised an instrument for the purpose having a narrow cimeter-shaped blade which, with my modification, has been described in the chapter on Instruments, page 43. Early in 1863, I had the scissors, of which a cut is given on page 41, made for this operation. These scissors were the first used for this operation, and are of interest from being the first of the various forms now in general use. Their introduction was of no little importance, since they gave an impulse to this branch of surgery and have afforded a facility for performing many operations in which the knife is of little value.

In the article just quoted from (written in 1865), I stated " I have for several years in this, as in all other operations of obstetrical surgery, substituted, as far as possible, the use of the scissors for the knife.

" The scissors that I have been in the habit of using for this operation are flat on the face, but have the blades bent at an angle from the handles, so as to conform somewhat to the direction of the uterine canal." I prefer the scissors for the operation, since, in addition to the loss of blood being less, I am certain that the risk from blood-poisoning is not so great after the parts have been crushed apart by a pair of scissors, as when separated by a clean cut. The process of healing is also comparatively less rapid after the use of the scissors.

The proper time for performing the operation is within a few days after the cessation of the menstrual period, but should not be undertaken so long as the slightest tenderness can be detected in the vagina on pressure of the finger. An excellent feature in the preparatory treatment is the administration, once or twice a day, of a large hot water vaginal injection. As an essential, before every operative procedure, it is necessary that the bowels should have been emptied within a few hours of the operation. After preparing a proper table for the operation, the patient is to be placed on the left side, and her body, as well as her limbs, protected from exposure to cold. After introducing the speculum, by seizing the anterior lip of the uterus, and drawing it gently forward, a series of small radiating folds are generally formed and can be noticed passing backward from the vaginal junction at the bottom of the cul-de-sac. The starting point of these folds is along the vaginal junction, and they are to be the guide in limiting the incision through the posterior lip, so as not to wound the circular artery. While the cervix is being steadied by means of the tenaculum, a probe is introduced to the fundus, as a guide before making the incision. The tenaculum and the probe can then be held in one hand, and with the other the division is to be made. One limb of the scissors is to be introduced within the uterine canal, alongside of the probe, to a sufficient depth to extend the incision through the posterior lip, stopping just short of the vaginal junction, the point from which the folds radiate, as has been described. It will be seen by a glance at Fig. 56, that the blades of the scissors must necessarily move in an arc of a circle along the line A B, by which a triangular portion will remain. For its removal, I use the ball and socket knife (see page 43), by passing the blade, with its cutting edge backward, along the probe as a guide, into the canal beyond the point C,

Fig. 56.



Lines of incisions in flexure of the cervix.

and the triangular portion is divided along the line C A, as the instrument is being withdrawn. The probe can then be removed, and, by the passage of an ordinary uterine sound, the extent to which the canal has already been opened can be ascertained, and the necessity for extending the incision can also be judged of by the same means. After a few moments' delay, to ascertain the extent of bleeding, the vagina can be packed with some substance to form a tampon, as a protection against further loss of blood. We may use for the tampon either damp cotton, which has been saturated with a solution of alum, and afterwards squeezed nearly dry, or a fine quality of oakum. After an operation of this kind the oakum is preferable, if the best quality can be obtained. It has in itself disinfecting properties, and whe properly introduced does not shrink in bulk, as the cotton tampo always does after a few hours. In a previous chapter, the use an mode of introducing the tampon are fully treated of, and it becomes therefore, unnecessary to repeat these directions. Before introducing the tampon, a portion of cotton, saturated with glycerine, should b passed, by means of the applicator, well into the cervical canal, an be allowed to remain packed between the cut surfaces until loosene by commencing suppuration. The vagina should be well filled by th tampon, as if a hemorrhage actually existed at the time, since th only safeguard against the dangers of hemorrhage is to prevent it occurrence. It is far easier to prevent a hemorrhage than to arrest i after it has once begun. It is a peculiarity of vessels situated i loose cellular or erectile tissue, that, when cut across, their orifice become rapidly dilated from the rotatory force created by the current in its escape.

It is a fact well known in hydraulics, that the amount of fluid which can escape from a pipe, in a given time, will vary according t the shape of the orifice. When the orifice is trumpet shaped, like th dilated vessels, the escape of fluid in a given time will be many-fol greater than that which would issue from an opening made only equa in calibre to the diameter of the pipe itself. Therefore, the quantity of blood which will escape from one of these vessels will be in proportion to the length of time the flow is allowed to continue. I hav frequently noticed the mouth of a divided vessel in this tissue increas rapidly in size from a mere point to an orifice sufficiently large t admit the extremity of a probe. The occurrence of hemorrhag should, therefore, be guarded against, not only for the exhaustion i induces, but because it also renders the patient more liable to inflammation. This may take place not only from the greater volume o blood which would naturally flow to the parts, but in consequence o the exposure to which the patient must be subjected in the attempt a arresting the hemorrhage. Frequently, the bleeding at the time o the operation is sufficient to make the use of a large tampon necessar as a precautionary measure. This will often excite irritation fro the pressure produced at the neck of the bladder, and if not relieved will cause much suffering to the patient. To guard against this, a suppository of morphine and belladonna may be introduced into th rectum, immediately after completing the operation, or an enema o some preparation of opium may be used for the same purpose. Afte the lapse of a few hours, a portion of the tampon, from the immediate neighborhood of the neck of the bladder, may be removed if there is no indication of hemorrhage at the time, and this will be made evident by the appearance of the cotton at the vaginal outlet. To enable the operator to remove the cotton with safety, it is necessary that the patient should make no exertion. Her shoulders should be shifted to the middle of the bed by drawing on her pillow, so that her body will lie across the bed with her limbs drawn up, and her hips resting near the edge. The index finger, as a guide, can be gently introduced into the vagina without exposure of the patient, and alongside of it can be passed the forceps, or the notched whalebone stick. By twisting the end of the stick into one piece of cotton after another, a sufficient quantity can be removed to give entire relief. But unless this necessity exists, the patient should not be disturbed until the second day after the operation, when the tampon must be carefully withdrawn and renewed. To do this properly, it will be necessary to place the patient on the table, and to make use of a speculum. The tampon is to be removed piece by piece until the cervix becomes exposed, but, to avoid causing hemorrhage, the plug between the sides of the wound should remain undisturbed until the third or fourth day, when it will become loosened by suppuration. Before replacing the tampon, I make it a rule to swab out the vagina with hot water as thoroughly as can be done, by means of a large piece of sponge held in the grasp of a probang, or a pair of forceps. Then over the cervix is to be placed some cotton saturated with glycerine, to which should be added a few drops of impure carbolic acid, and afterwards the tampon. As soon as the plug can be removed readily, and the wound begins to discharge, the granulating surfaces may be cleansed by carefully throwing in a little warm water by means of a syringe. A fresh plug of cotton, saturated with glycerine, should be introduced daily between the edges of the wound, but, before doing so, the sound must be passed with care into the uterine canal, so that, as it is being removed, its point may be drawn with sufficient pressure along the angle of the wound to keep it from uniting too rapidly. For the first five or six days, but little more will be needed than to break up the healing in the angle just at the vaginal surface, for at this point, the union will first begin, and contraction rapidly follow. The tampon may be lessened in size after the second removal, according to the existing tendency to hemorrhage, and after the tenth day may, as a rule, be discontinued. But it will be then necessary to resume the vaginal injections in the morning, with a glycerine dressing afterwards.

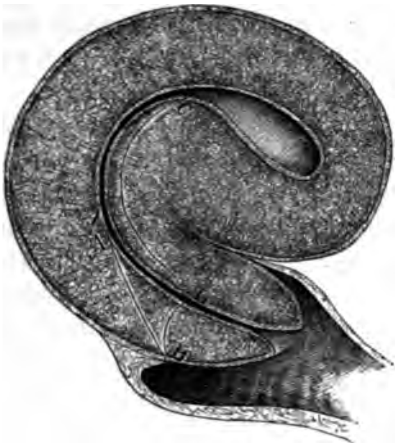
The patient cannot be watched with too much care, to guard her against exposure to cold and consequent inflammation, which is almost always brought on by some imprudence on her part. For the subsequent examination, she should be protected by stockings and drawers, and be lifted from the table to her bed while wrapped in a blanket which is to cover her from the shoulders to the feet. When necessary, she must use the bed-pan in the recumbent position, if possible, but if she be so unfortunate as to be unable to empty the bladder while in this position, the catheter must be used during the first week. As a rule, it is not safe for a patient to sit up until at least ten days after the operation, and even then, if any tenderness can be detected by pressure of the finger in the vagina, she should remain in bed until the danger has passed. I do not consider a patient safe from the dangerous effects of this operation until after the next menstrual period. Although, as a rule, I permit a patient to sit up after the tenth day, I insist on the greatest care being observed that she shall not remain up long enough to suffer from fatigue, until all danger has passed. Moreover, experience has taught that it is necessary for the patient to remain in bed during the subsequent menstrual period, and the rule should be observed notwithstanding there be apparently no occasion for this precaution. Menstruation always returns before the parts have become thoroughly healed, while the pelvic vessels are still overcharged, in consequence of the irritation following upon the operation, and as an accompaniment of the reparative process. Therefore, the serious features of the condition are not exaggerated. The danger to life is not so great as it would have been within a shorter time after the operation, but without care during this menstrual period, the risk of some additional complication is certainly very great, whereby the condition of the woman would be made infinitely worse than it was previous to the operation. Much of the disappointment attending the unsatisfactory results which have followed this operation can be attributed to the want of an appreciation of the necessity for maintaining the recumbent position at this time. I am certain there will be very few of my readers, after any experience in this operation, who will not be able now to recall many instances of unexpected complications coming on after the menstrual period. The uterus will be found suddenly enlarged, or thickening will be detected between the folds of one or both of the broad ligaments, or even the existence of an hematocele will be recognized for the first time after the menstrual period has ceased, although, before the flow came on, there may have existed no indication of any complication. The most frequent complication is the sudden enlargement, or congestive hypertrophy, of the uterus, which will suddenly come on, or be detected after the patient has been supposed to be convalescent. She may not have been specially imprudent, yet no particular care probably was taken during the menstrual period just passed, as hitherto the relation of cause and effect has not been recognized.

We have seen that a long cervix is sometimes the cause of retroversion, a position which results in flexure as the fundus of the uterus settles lower into the hollow of the sacrum, and the neck becomes pressed upward against the anterior wall of the vagina. Formerly, I divided the anterior lip upward in the median line, for the relief of the dysmenorrhœa which always accompanies this form of flexure of the cervix. But experience at length taught me that no relief can be obtained by any surgical means, so long as the body of the uterus remains retroverted, and that any operation of the kind is always attended with great danger. Whenever the fundus becomes so much displaced backwards as to cause a flexure in either the body or the cervix, inflammation will have long before been excited in the neighboring cellular tissue as a consequence of the malposition. So long as the displacement of the uterus exists, an irritable condition will remain afterwards latent, which will require much less provocation than a division of the cervix to establish the inflammation in full force. To my sorrrow, I have had pelvic cellulitis with abscesses frequently occur, and death in one instance, after the most careful preparatory treatment previous to dividing the cervix of a retroflexed uterus, when, at the time, there was not the slightest indication of danger. In fact, I am unable to recall a single instance where inflammatory symptoms did not occur, if an attempt was persevered in to keep open the incision while the uterus remained in this position. The uterus must be gotten into a favorable position or anteverted by a pessary, as shown in Fig. 54, when, if the cervix is too long, it may become flexed in the opposite direction. Then, if necessary, after the proper preparatory treatment, the cervix may be divided backward.

In the treatment of flexures of the uterine body, we are to be guided by the same general principles as would be applicable to the treatment of disease of uterine condition without the accident of flexure. We may, however, accept the presence of the flexure as conclusive evidence that the most careful general treatment will be necessary, and without it the local means to be employed will prove of little value. Just in proportion to any improvement which can be brought about in the general condition to influence and give tone to the pelvic vessels, will the degree of flexure be lessened. The chief local means to be employed for giving tone to the vessels and removing the chronic state of venous stagnation will lie in the proper use of the hot-water vaginal injections. The frequent use of iodine will be of service when applied throughout the canal by means of the applicator, after this has been bent to the proper curve, corresponding to the degree of flexure, as ascertained by the use of the probe. When the uterus is enlarged, and the cervix hard, a blister of the acetic solution of cantharides applied to the neck, shortly after each period, will be of service. This agent will relieve the local congestion by the watery discharge it produces; the revulsive effect will prove beneficial also, and the remedy is further valuable in exciting uterine contractions. The daily use of glycerine, to be applied in the vagina by saturating with it a sufficient quantity of cotton, will prove indispensable. Whenever the stomach will tolerate the use of small doses of ergot in some form, the remedy should be given in conjunction with tonics, since its effect on the pelvic and uterine circulation will prove most beneficial. But to obtain the wished-for result from this agent, its use must be long continued, and in such doses as not to cause any disturbance of the stomach or marked uterine pains, since the latter would establish a condition calculated to increase the degree of flexure.

It has already been stated that, in consequence of long-continued pressure at the angle of flexure, absorption of tissue gradually takes place, leaving a condition of permanent deformity. With this condition existing, and with the disappearance of all evidence of cellulitis, it is the proper treatment to open the passage sufficiently that the flexure may no longer produce dysmenorrhœa, or, by retention of the secretions within the canal, maintain an exciting cause for future disease and relapse. Fig. 57 is intended to illustrate a flexure of the body above the vaginal junction, which has remained unchanged after the proper treatment. For the operation, the same directions are applicable as have already been given. The posterior lip is to be divided backward by scissors along the probe, in the canal as a guide, in the median line to BD, and then the triangular portion ABD is to be incised by means of the ball-and-socket knife. The blade of the knife is then to be reversed, with its cutting edge towards the operator. The uterus must be steadied with a tenaculum held in the same hand with the probe, which had been previously introduced to the fundus to serve as a guide. The blade of the knife can then be passed alongside of the probe, when it will divide rather more than its width, as shown by the line DC, and this will complete the operation. The after treatment is to be essentially the same as that already described for division of the cervix. This operation, when performed at the proper time and under the proper circumstances, is often followed by very satisfactory results. Yet in my experience it has often failed, and there has been a gradual return to the previous condition, and sometimes the contraction has been even greater than existed before the operation.

Fig. 57.



Lines of incisions in flexure of the body.

During the period from Sept. 1, 1862, to May 1, 1872, while I held the position of Surgeon-in-Chief to the Woman's Hospital, there were eighteen hundred and forty-two patients treated in the institution under my charge. Of this number, the cervix was divided fifty-six times for flexure. There were three cases of serious cellulitis following these operations, but complete recovery took place in each instance, and without the formation of pelvic abscesses. Two deaths occurred as the result of general peritonitis, brought on after these patients were well enough to be up, caused by their own imprudence just as the first menstrual period after the operation was coming on. One of these patients was sent to the hospital by Dr. Bauer of Brooklyn, but now of St. Louis. After she had been up for several days, she asked permission to take a bath, which was refused, and she was reminded that her menstrual flow would soon be due. Notwithstanding this caution, she took a cold sponge bath with her window open, on a mild day, as it happened, although in the middle of winter.

She was seized with a chill before she had completed her toilet, and this was followed by a violent attack of peritonitis, of which she died in a few days. The other case, I had operated on just before the change in the organization of the Woman's Hospital, in May, 1872, and, after a few days, she passed from my service. She continued to do well until three weeks after the operation, when on going out for the first time, she imprudently indulged in too long a drive, was taken sick before her return, and died within a few days from general peritonitis.

From the autumn of 1862 until the same season in 1875, when I began to arrange the statistical material which has been used in this work, I had treated two thousand and thirty-six cases in my private hospital. Of this number, there had been forty-nine cases of flexure where the cervix had been divided, and from which one death had occurred. The cause of death was general peritonitis coming on in a case where I imprudently performed the operation on the day after her arrival from a long and fatiguing journey—to oblige her physician, who insisted on returning home without delay. In this instance, the patient did well for a week, when the menstrual flow came on, I believe, at the regular time, but she had, through ignorance, or with the view of avoiding the delay, misrepresented the fact. Having had the good fortune, in early life, to witness the results in the practice of others, I made it a rule never to perform this operation outside of either the public or private hospital. I felt that by this plan alone would a patient be kept sufficiently under control to protect her from her own imprudent acts. Consequently, I have never operated but twice outside, and both cases remained afterwards under the charge of their physicians. One of these ladies suffered from a retroflexion; she was a foreigner with whom I was unable to hold any personal conversation. The operation was performed in a large hotel, where she could not get the proper care, and she suffered, I have no doubt, from exposure. The consequence was an attack of cellulitis, which terminated in a pelvic abscess, from which she died after many months of suffering.

Formerly, cellulitis after this operation was not an infrequent occurrence in my private hospital, and I have had several instances of pelvic abscess occur, from which, however, recovery finally took place. But, for years past, I have had no difficulty, since I have appreciated the necessity for carrying out in detail the precautions which I have endeavored to impress upon the reader.

When the uterus has become retroflexed, the fundus must be gotten out from the hollow of the sacrum as soon as possible. But frequently the uterus is found bound down by adhesions, or in too tender a condition to be moved with safety. We must, as in the treatment of other flexures, resort to the continued use of hot water injections, hot baths, blistering the cervix occasionally, daily glycerine dressings, with the most careful attention to the state of the bowels and the general health. By degrees, as the tenderness on pressure subsides, the fundus should be lifted day after day, as far as prudent, and without attempting too much at any one time. I have succeeded, after months of careful daily manipulation, in restoring the uterus to its normal position, with the gradual disappearance of a marked flexure, when, in the beginning, the organ was apparently bound down by adhesions.

CHAPTER XIX.

PROCIDENTIA, OR PROLAPSE OF THE UTERUS.

Causes—Etiology; Table XXXI., showing the relation of procidentia to age, pregnancy, injury, labor, and other conditions—Treatment, pessaries, surgical measures—Cystocele—Rectocele.

This condition may exist in every degree of displacement, from a simple sagging of the organ to the final escape of the uterus from the vagina. By general use, the term procidentia is applied more to the condition of prolapse where some portion of the organ has already passed the labia. Prolapse of the posterior, or recto-vaginal septum, constitutes what is termed a rectocele, and the same condition of the anterior one, or the vesico-vaginal wall, forms a cystocele. In practice, procidentia and prolapse have been generally regarded as two distinct lesions. I shall, however, treat of the subject as a displacement of the uterus, where each of these conditions will be regarded as only steps in a process which may terminate in the final escape of the uterus from the vaginal outlet.

The immediate causes of prolapse are threefold, either some growth above the uterus crowds it downward, or there is an increase of weight in the organ itself, or there is a want of proper support below. The first step in the process is usually to be traced directly to the absence of support for the vaginal walls at the outlet of the passage, from which a further prolapse is soon induced by the increase in weight of the organ resulting from its mal-position. To whatever cause the increase in size and weight of the uterus may be due, the organ will settle into the pelvis just in proportion to the additional burden.

Complete procidentia is essentially a condition of middle life or old age, and occurs usually in those who have given birth to more than the usual number of children. But I have seen it occur in young unmarried women, in consequence of tenesmus excited by dysentery, or from lifting, by which the uterus became at first retroverted. I have also met with several instances in which the displacement was caused by the disturbance excited from uterine contraction, in the attempt of the organ to drive out a pedunculated fibrous polypus.

In these cases, the procidentia remained complete after the expulsion of the polyp, and after it had sloughed away.

Laceration of the perineum, or a patulous state of the vulva, must take place in every instance before the procidentia can become complete. If the pressure from above is sufficient to crowd the retroverted uterus down against the perineum, it will become gradually distended, and the neighboring tissues so thinned out from absorption, that the proper resistance can no longer be exerted.

In practice, we will have to deal with the effects of childbirth as the most common of all causes in producing procidentia, and in all these cases the perineum will be found extensively lacerated. Under certain circumstances, the neck of the uterus becomes lacerated, and whenever this accident occurs, it will always keep up a sufficient irritation to arrest the involution, or natural decrease in the size, of the organ after childbirth. The uterus in this condition, from its weight, rests on the floor of the pelvis, and acting then as a wedge to keep the vagina dilated, the cervix will soon present at the vaginal outlet. Frequently, the same cause, producing laceration of the neck of the uterus, will also split the perineum, and when this accident has occurred to an unusual degree, so little resistance can be offered to the uterus that the procidentia may soon become complete. From a want of support below, the recto-vaginal wall naturally prolapses and forms a rectocele. Along the sulcus, on each side, the walls of the vagina are attached to the connective tissue and fasciæ of the pelvis, from which the canal receives much support. As fold after fold of the posterior wall of the vagina becomes prolapsed, the connective tissue of the pelvis will, in turn, stretch sufficiently to throw the weight on a portion beyond, until, at length, the uterus is reached, and as soon as the utero-sacral ligaments have been stretched sufficiently, the uterus becomes retroverted. As the organ then settles towards the vaginal outlet, the anterior wall of the canal prolapses from behind forward, thus forming a cystocele. The tissue just posterior to the neck of the bladder will then be the last to escape as the procidentia becomes complete.

When laceration of the perineum occurs, and the enlarged uterus happens to be left anteverted, the cervix will settle on the floor of the pelvis with the fundus behind the symphysis. This position will also keep up the hypertrophy, but complete procidentia cannot take place unless the uterus happens to become retroverted. But with no support at the outlet, the tissues about the urethra soon thicken, and, in turn, begin to prolapse. This relaxation will in time involve the whole septum between the vagina and bladder, so that the mass will, at length, protrude from the vagina as a cystocele. After a cystocele has once formed, with a laboring woman, it will be but a question of time before the uterus becomes retroverted. This displacement will facilitate a prolapse of the recto-vaginal wall, and after both a cystocele and rectocele have formed, the procidentia will soon be complete.

In early life, even with extensive laceration of the perineum, the formation of a procidentia is not the rule unless the woman be exposed to the risk by accident, or from the character of her occupation. A woman with a moderate degree of laceration may bear a number of children afterwards, with the uterus remaining, between each pregnancy, enlarged and lying on the floor of the pelvis for years, without any apparent increase in the amount of prolapse. At length the time arrives for the change of life, and nature will make the attempt to bring about the process. Her efforts will then fail in diminishing the size of the uterus, and the period will only be recognized by an increase in the length and quantity of the menstrual flow. Finally, nature accomplishes what she can in bringing about the usual changes in the vagina, by which the posterior cul-de-sac disappears and the canal becomes shorter and lessened in diameter. The consequence is that the uterus is brought much nearer to the outlet by the shortened vagina, retroversion naturally follows, and it then requires but little more exertion to complete the procidentia. Then the uterus, being relieved from any obstruction to its circulation, soon undergoes the natural change and becomes atrophied, but the displacement of the organ continues to exist unless relieved by art.

Etiology of Procidentia.—By means of Table XXXI., a comparison will be made between those who suffered from procidentia. These were, as to one class, treated in my private hospital, and as to another in the Woman's Hospital. With the one, every comfort of life had been enjoyed; with the other, want had doubtless been the rule.

Those treated in the private hospital had had, without exception, the advantage of the best medical attendance during labor. The contrary, however, was, in all probability, the rule with the greater number of those admitted to the Woman's Hospital.

This table does not include all who were treated for this lesion in the Woman's Hospital, since a number were discarded in consequence of some serious defects in their record. All of those in the Woman's Hospital were operated on previous to May, 1872, and during the time I had charge of the institution. Those from my private hospital were treated previous to Jan. 1874.

In explanation of Table XXXI., we will take as an example the total number who suffered from procidentia. It will thus be shown that in both institutions 86 cases were treated, the average age, at the time of seeking relief, being 41.66 years. Only 78 of these were able to give the age at which the menstrual flow first made its appearance, and a still smaller number the date of marriage. The averages, throughout the table, are calculated on the number placed above them, these representing the actual number who were able to give the information. Of these 86 women, each bore, on an average, 3.82 children, and 21 of them had a certain number of miscarriages previous to the labor in which the injury was supposed to have been received. Nineteen of these afterwards gave birth at full term to children, while 14 miscarried. Altogether these 86 women were impregnated 438 times, averaging over five pregnancies to each woman. With 85 of these, it is shown that the average time, previous to admission, and since the reception of the injury, was 7.85 years. A total of 753 years had elapsed since the last pregnancy, which would give an average of 8.85 years for each woman. It will be seen that 20 women, of the total number of 86, had already gone through a change of life, on an average of some seven years, before seeking relief, and at the average age of 46.80 years. It is also shown that the average age at which the injury was supposed to have been received was over 33 years, and it was not generally until after the birth of the second child that the injury occurred.

Finally, the connection is noted between the time of undergoing the change of life, and the first appearance of the displacement. Thus 67 women, with complete procidentia, had first noticed the displacement at an average of eight years or more before seeking relief, and none of these had then had a change of life. But with 17 women this change had already occurred, and afterwards at the average age of 51.88 years, the procidentia took place.

So far as we are justified in drawing any deductions, in proof of a general law from so small a number, it is evident that laboring women seek relief at an earlier age than those in the upper walks of life. In consequence of a life more exposed to hardship, among the poorer class of women, a gradual prolapse does not take place as would occur under more favorable circumstances. The procidentia becomes complete much earlier in life, as is shown by the comparatively small number who are found suffering only from rectocele or cystocele.

TABLE XXXI.—*Showing the relation of Procidentia, and its several stages, to Puberty, Marriage, Change of Life, etc.*

			Age at the time of			Number of pregnancies.											Character of the labor when injured.										First noticed the displacement.	
						Before injury.		After injury.																				
			Admission.	Puberty.	Marriage.	Children.	Miscarriages.	Children.	Miscarriages.	Average number of pregnancies.	Length of time since receiving the injury.	Average number of years since last pregnancy.	Age at change of life.	Average in years since change of life.	Age at the time of injury.	Average labor in which the injury was received	Not stated.	Natural.	Rapid.	Tedious.	Forceps.	Turning.	Traction.	Pairs of twins.	Large children.	Retained placenta.	A certain time before the change of life.	At an average age after the change of life.
Procidentia.	Private Hospital.	Number	42	41	41	42	8	7	8	....	41	....	15	....	42	30	27	1	1	7	..	..	3	2	1	..	30	12
		Average	41.26	14.29	21.85	4.45	2.87	2.42	2.12	5	9.00	11.19	46.13	7.04	35.00	3	..	..	..	..	..	..	..	..	..	..	10.60	52.58
	Woman's Hospital.	Number	41	37	35	41	13	12	6	....	41	....	5	....	43	38	17	4	..	4	8	3	1	3	3	1	37	5
		Average	39.18	15.21	25.31	3.20	1.53	2.16	1.00	4	6.79	6.58	48.80	7.40	32.34	2	..	..	..	..	..	..	..	..	..	..	7.32	50.00
	Total	Number	86	78	76	86	21	19	14	438	85	7.53	20	....	85	68	41	5	1	11	8	3	4	5	4	1	67	17
		Average	41.66	14.73	28.44	3.82	2.04	2.26	1.04	5	7.85	8.85	46.80	7.12	33.24	2	..	..	..	..	..	..	..	..	..	..	8.64	51.88
Rectocele.	Private Hospital.	Number	45	45	45	45	6	15	2	....	45	....	8	....	45	38	20	3	1	7	4	3	..	4	3	..	40	5
		Average	37.33	14.04	23.20	2.35	2.55	2.55	1.50	3	7.06	7.75	45.87	6.02	20.95	2	..	..	..	..	..	..	..	..	..	..	8.87	47.60
	Woman's Hospital.	Number	22	13	16	22	5	10	3	....	22	....	5	....	21	18	8	1	2	1	7	..	1	..	1	1	19	2
		Average	34.77	14.23	22.62	2.31	1.20	2.20	1.00	3	6.90	4.40	47.20	4.00	28.19	2	..	..	..	..	..	..	..	..	..	..	7.50	48.50
	Total	Number	67	58	61	67	11	25	5	....	67	....	13	....	66	56	28	4	3	8	11	3	1	4	4	1	59	7
		Average	36.49	14.08	21.40	2.32	1.90	2.40	1.20	3	7.01	6.65	46.38	5.15	29.69	2	..	..	..	..	..	..	..	..	..	..	8.44	47.85
Cystocele.	Private Hospital.	Number	17	17	17	17	5	1	..	....	17	....	8	....	17	9	15	1	..	..	1	..	..	..	..	..	9	8
		Average	40.05	13.94	20.53	4.23	2 00	1.00	..	4	5.52	5.52	47.25	3.87	36.00	2	..	..	..	..	..	..	..	..	..	..	5.33	46.25
	Woman's Hospital.	Number	10	7	9	10	2	1	..	....	10	....	1	....	10	9	1	3	..	2	1	..	1	1	..	1	9	1
		Average	38.70	13.42	20.22	4.00	4.00	1.00	..	4	6.70	9.10	50.00	6.00	32.00	3	..	..	..	..	..	..	..	..	..	..	6.86	50.00
	Total	Number	27	24	26	27	7	2	..	....	27	....	9	....	27	18	16	4	..	2	2	..	1	1	..	1	18	9
		Average	39.55	13.79	20.46	4.16	2.57	1.00	..	4	5.96	6.85	47.55	4.11	34.51	2	..	..	..	..	..	..	..	..	..	..	6.11	46.66
	Private Hospital.	Number	104	103	103	104	19	23	10	....	103	....	31	....	104	77	62	5	2	14	5	3	3	6	4	..	79	25
		Average	40.57	14.12	21.23	3.59	2.52	2.43	2.00	4	7.58	8.86	46.35	5.91	32.64	2	..	..	..	..	..	..	..	..	..	..	9.00	41.56

The woman who has had the perineum extensively lacerated may, if properly cared for, go, as shown by the table, for over two years before suffering, and then average eleven years before the procidentia becomes sufficient to demand relief. But if she be a washer-woman, or in a station of life where she cannot be cared for, she will begin to suffer in less than two months after the labor, and will be unable to work longer, on an average, than six years before some relief becomes necessary.

In consequence of neglect in obtaining the necessary information, or from inability on the part of the patient to furnish it, the character of the labor in which the injury was received has unfortunately not been recorded in a large number of cases. But we have sufficient data to recognize the fact that artificial delivery was practised among the poorer classes much more frequently than among those who were better able to command the time of the medical attendant. If we continue the comparison between the two stations of life for those cases where the procidentia has become complete, it will be seen that the woman in the upper walks of life not only bore more children before the occurrence of the accident, but during her whole menstrual life she became pregnant a greater number of times. A greater portion, if not all, of these women were doubtless in perfect health before being injured in childbirth. Therefore, these averages must be very near correct. The average number of children for both classes is greater than that obtained on the general average of all the women under observation. The average age of puberty for the women treated in the private hospital is essentially the same as that obtained on the general average, and may be accepted as being very near the proper one for the better class of women. The average for those treated in the Woman's Hospital gives evidence of a much later development among the poorer classes, and this might be expected from what has been already stated on the subject of menstruation.

Treatment of Procidentia.—Many years ago I formed the acquaintance of a shrewd and eccentric physician, I believe now dead, who lived in the Currituck district, near the Virginia border. This gentleman was very much amused at the surgical procedure I employed for the relief of procidentia, and did not hesitate to inform me of his want of appreciation of it. His practice was almost exclusively confined to the negroes, among the women of which race the lesion is common. He stated that he could cure any case in ten days, and had employed the practice for many years. His plan was to swing the woman in a sling from a beam, in the knee and chest position.

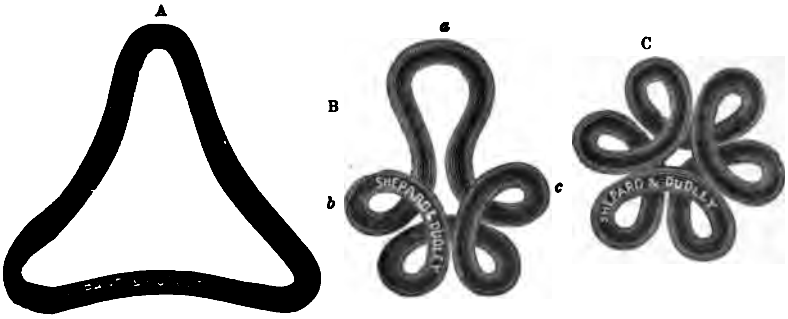
This was maintained for the ten days, during which time the vagina was kept filled with a strong decoction of oak bark, which was changed every day by means of a syringe. He assured me that with a properly padded sling there was no difficulty, for the woman slept all the time, and was not disturbed except to receive her food or answer a call of nature. From others I have since learned that his statement was correct, so far at least as his success in the treatment of this displacement was concerned. Although this plan would not be practicable for any other race, and is so but to a limited extent among negroes, yet I should think his principles of treatment were correct.

This difficulty, as we have seen, has its origin in consequence of the enlarged uterus, from some cause, remaining settled, after labor, on the floor of the pelvis. The already over-stretched vagina cannot regain its normal size, nor the uterine ligaments recover their integrity, so long as the uterus occupies this malposition, and acts as a wedge to continually increase the dilatation.

If it were possible to lift and maintain the uterus at its proper position in the pelvis, the organ would be able, in all probability, to regain its natural size. But under any circumstances, by correcting this position, the vagina at least and other supports of the uterus would be able to return to a normal condition. With a large and relaxed vagina this cannot be done by any mechanical means yet devised. Beyond a certain point these means are futile, and a pessary, in any form, will prove of but temporary benefit, and in the end be positively detrimental. When the vaginal walls have become very much relaxed, it is impossible to prevent them from crowding down within the circumference of any fenestrated form of pessary. This will occur to an extent almost producing strangulation, unless the instrument be of a sufficient length to put the passage on the stretch. In either case the result is the same by increasing the capacity of the vaginal canal and by adding to the enlargement of the uterus from still further obstructing the circulation. When a solid instrument is used, the capacity of the canal is also increased by the walls crowding in around it, and pressing it forward as a dilator. One instrument after another will be resorted to, with the necessity of increased size for relief, until the canal may be dilated to the full extent of the pelvic passage. The patient must then become bedridden, or she may be relieved of the most urgent symptoms as the uterus escapes from the vagina and the procidentia becomes complete.

Some surgical procedure must be our final resource, but it is always advisable to administer preparatory treatment previous to the operation. Should the uterus be much enlarged, treatment directed to diminish its size would add greatly to the chances for success from an operation. An erosion should always be healed beforehand, and when the cervix has been lacerated, the surfaces should be united, since this surgical interference will of itself greatly reduce the size of the uterus. It is necessary to antevert the uterus, which is usually retroverted, or to lift it from the floor of the pelvis, if it simply sags from increased weight. As soon as the uterus is placed in a position where the circulation can again become established, it will decrease rapidly in size. It will often prove difficult to adjust any form of pessary for correcting a retroversion, where the perineum has been lost, and the only point of support to be had is behind the symphysis. Yet, by having the patient under observation, and by studying the peculiarities of the case, it can be accomplished. Whenever tenderness on pressure can be detected, iodine must be applied from time to time, and the hot water vaginal injections steadily employed. We should never operate under any existing indication of cellulitis, and whenever there is detected so much tenderness at any point as to contra-indicate the use of a pessary, we must resort to other means for gaining the needed support. The India-rubber disk may sometimes answer, or a cotton support shaped like a mushroom, and saturated with glycerine, to be renewed daily. Whenever a pessary is employed, it must be watched with unusual care, for when such a redundancy of tissue exists, a fold may become readily strangulated or packed in at some point, so as to cause the instrument to cut into the tissues elsewhere, as if it were too large.

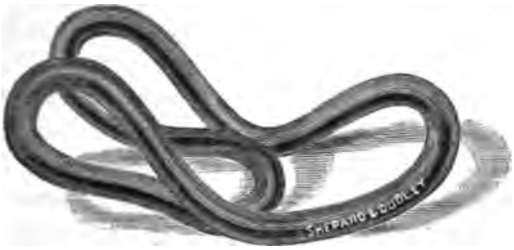
Fig. 58.



Block-tin pessary for procidentia.

For procidentia, I have used a home-made instrument which has frequently proved of great service in my hands. I have some block-tin rings of from six to nine inches in diameter, which I first bend into a triangle with rounded edges (A, Fig. 58). I next gradually bend the centres of each side towards the middle, so that each of the three openings will be equal, as nearly as possible, in size (B, Fig. 58). The instrument is then completed by bending over ends *a b c* together, and then flattening the instrument, if it be of large size, between the palms of the hands, so that it will be about one-third less in height than in width (C, Fig. 58). This instrument is intended, when not needed for a capacious vagina, to be of the same size and shape on all sides, as I have attempted to show in the portion of figure marked C. When made uniform in shape, the instrument can scarcely cut at any point, since pressure will cause it to roll over, or change its position. It is intended that the openings should be large enough to admit a fold of tissue, which will meet in the centre from each side. Since it is impossible for a very large fold to enter, the tissues cannot become strangulated. The vaginal tissue becomes literally buttoned into the instrument. Although the tissues are frequently changing their position, as well as the instrument, yet they never become disengaged from it, and when the proper shape has been given to the instrument, it can scarcely be forced out of the vagina. I have seen some of these instruments made of material so large in diameter as to be worthless, since the openings were thus left so small that the tissues could not enter in a fold sufficient to hold it in place. Different modifications of this instrument may be made useful. The end A may be opened and made longer than the other two portions, so as to enter the cul-de-sac, when support will be given to the uterus from behind and under each broad ligament. Instead of forming a triangle in the first instance, a larger ring may be used, making it square, and bending the four corners over and together as has been described for the triangle. One angle can then be opened to go into the posterior cul-de sac, two in the middle, left closed to support the anterior wall, and the remaining one bent back, and so shaped as to give support to any rectocele that may require it. For rectocele alone, I have sometimes employed another form when the support is taken from behind the symphysis. It is made by bending together an unusually long closed lever pessary, as in Fig. 59, so that more than half its length will reach just beyond the cervix, and the other, or shorter portion, will come across the posterior wall, about an inch or more from the vaginal outlet. Over this under blade, I frequently stretch an India-rubber band, or close it by a portion of thin sheet lead, such as is found in tea boxes. The portion which is to rest near the neck of the bladder must have a proper depression made, so as not to exert any pressure there, and the corners should be properly rounded off. When this instrument is well fitted, any downward pressure tilts the long lever up behind the pubes, and prolapse cannot take place, since the uterus is held from coming forward, and the cross-bar supports the rectocele. The material for these temporary instruments should always be block-tin, since this will admit of any necessary change of shape. When the pessary has been introduced, if of block-tin, two fingers can be inserted into the vagina, and the sides of the instrument may be spread apart at any point, or narrowed if necessary. Whenever the patient is beyond the reach of the personal observation or control of the physician, the prudent course would be to employ only the India-rubber disk, or the cotton support. As has been stated, the use of pessaries in these displacements requires constant observation, and yet, in spite of all care, the patient will sometimes suffer. One precaution is necessary on removing a pessary or the cotton support, namely, to disengage the instrument before withdrawing it. If this is not done, the uterus is always dragged down to the outlet before it becomes filled, and consequently but little progress will be made. I always direct the patient, when removing it herself, to pass one finger on each side of the cotton dressing, so as to afford some support to the parts as this is withdrawn.

Fig. 59.

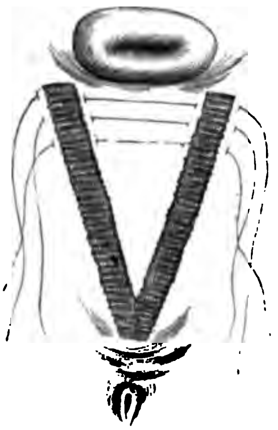


Long closed lever pessary for procidentia.

Frequently some attention needs to be directed to the general condition, and it is always absolutely necessary to regulate most carefully the condition of the bowels.

The object of all surgical procedures looking to the cure of prolapse is to support the uterus in its proper place in the pelvis, until it has recovered its natural size. This is accomplished by turning in the excess of tissue, and uniting freshened surfaces which should run nearly parallel on either or both walls of the vagina, and then properly closing the perineum at the vaginal outlet, so as to give suitable support from below. By these operations, the vagina will be restored to its original size and condition, while its natural capacity cannot be impaired by them. Their object is simply to relieve the over-stretched tissues from strain, that they may retract. This is done by taking in a plait, by which means the tissues thus turned in may regain their tone, and in a few months all trace of the operation disappears. It is a common impression held by the profession, that the object of the operation is to narrow the vagina, but the idea is erroneous, and a misleading one. This canal can be easily shortened by uniting denuded surfaces transverse to its axis. But to narrow the vagina in its diameter after puberty to a greater degree than existed in the virgin state, is impossible by any surgical procedure. This cannot take place except as a result of inflammatory action, accompanied by sloughing, when the cicatricial tissue thus formed contracts the same as elsewhere. When, by chance, the denuded surfaces, to be brought together by this operation, are so far apart that, when they are approximated, an undue degree of tension exists, the sutures will certainly cut out and leave the parts in their original condition. This is owing to the unyielding line formed along the vaginal sulcus on each side, which is connected with the pelvic fascia. This tissue, from its elasticity can be stretched to a certain degree, but no suture can withstand its persistent traction, beyond a few days, without cutting out.

Fig. 60.



Sims's operation for procidentia.

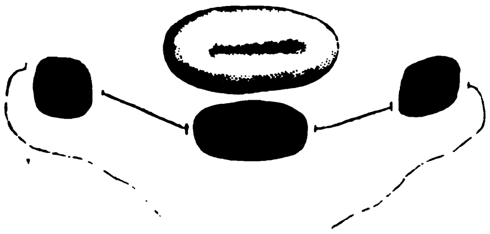
Marshall Hall many years ago suggested, but did not himself put the plan in practice, that for the relief of procidentia two denuded strips should be united running parallel on each side from near the cervix uteri to the vaginal outlet, thus making a double vagina as it were. This operation, however, failed in practice, as the anterior wall of the vagina would prolapse and gradually press back the septum, or, by pressure, excite absorption of the recently united surfaces until sufficient space had been thus produced for the escape of the uterus. Dr. Sims, in Feb. 1858, brought these two surfaces together to overcome this difficulty. He commenced the scarification on the anterior wall of the vagina, near the neck of the bladder, making the denuded surface diverging from a common point, as shown by the diagram, Fig. 60, extending to each side of the cervix uteri in the form of a triangle. These surfaces were brought together and secured in the median line with interrupted silver sutures. In this way the neck of the uterus was crowded towards the posterior cul-de-sac, and the fold of vaginal tissue thus formed in front of the cervix effectually prevented any prolapse of the organ.

Shortly after I took charge of the Woman's Hospital, in September 1862, and before Dr. Sims had reached Europe, whither he had gone to reside, one of the first patients operated on by him, after the method described above, applied for relief. She stated that during four years she had been entirely relieved by the operation. About three months before her admission, while in the act of lifting something, she had been suddenly seized with a tenesmus, which became persistent, and that her suffering had been continuous since that time. On examination, I found the line of union was prefect and with no prolapse of the vaginal wall. But the neck of the uterus had slipped into the pouch behind the septum formed by the operation, with the effect of throwing the fundus into the hollow of the sacrum, and fixing the organ in this position. With difficulty the neck was disengaged, and after returning the uterus to its normal position, immediate relief was obtained. On reflection it became evident that this accident would be of frequent occurrence. As soon as the uterus diminished sufficiently in size, so that its neck was no longer grasped by the fold formed in front of it, the latter would naturally override the cervix and force it into the pouch. On examining two other cases, which I had operated on within the previous eighteen months, I found the neck already behind the fold in each instance.

On the tenth of October, 1862, I operated on one of these cases to overcome the difficulty. I closed the triangle by running a denuded strip, as a base to the triangle, across in front of the cervix uteri. By this plan I connected the two diverging lines, shown in Fig. 60, and effectually prevented the possibility of an entrance into the pouch. Dr. Sims subsequently followed this plan, as practised by me, leaving, however, a small opening in the cross section, immediately in front of the cervix, which from its position might be objectionable. For some seven years afterwards I followed this method with but little change. I, however, appreciated that the operation could never come into general use on account of the difficulties to be overcome, and in consequence of the necessity for constant practice.

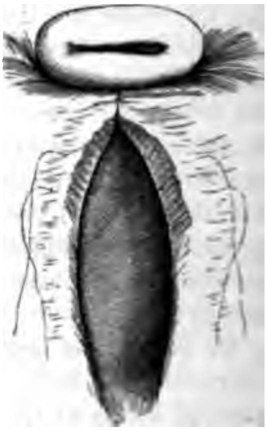
Early in 1869 I attempted to simplify the operation, and then adopted a method which I have since followed. I first antevert the uterus with my finger, as the patient lies on the back. The neck of the uterus is then kept crowded up into the posterior cul-de-sac by a sponge probang in the hand of an assistant, while the patient is being placed on the left side for the introduction of the speculum. I then endeavor to find some point, about half an inch to either side of the cervix and a little behind the line of its anterior lip, which two points can be drawn together in front of the uterus by a tenaculum in each hand. When two points, as triangular-shaped folds, can be thus brought together without undue tension, the surfaces are to be freshened. One of the tenacula securely hooked in the tissues, to indicate the point, must be released from the hand for the purpose of denuding, with a pair of scissors, a surface half an inch square about the point held by the other tenaculum. Then a similar surface is to be freshened around the point of the first tenaculum, and a strip afterwards removed from the vaginal surface, in front of the uterus, about an inch long by half the width (see Fig. 61). Having passed a needle, armed with a silk loop, beneath each of these freshened surfaces, as shown in Fig. 62, a silver wire is to be attached to the loop and secured by twisting, — thus bringing together in front of the cervix, as will be seen in Fig. 61, these three points, with the effect of forming a similar fold, but somewhat smaller than that formed by Dr. Sims's method. The chief advantages gained, apart from simplifying the operation, are these: With the loss of only a few drops of blood, the neck of the uterus, at the beginning of the operation, can be secured in the cul-de-sac, and we can thus dispense with the hand of an assistant, which must necessarily be in the way. By the old operation, the tissues forming the fold were drawn from behind, and wrapped around in front of the cervix, while the chief support was from the column formed in the median line, by turning in the redundant tissues below. By the method I have adopted, a direct lateral support is gained from the pelvic fascia, giving, in many cases, by this means alone, a sufficient support, entirely

Fig. 61.



Author's operation for procidentia.

Fig. 62.



Folds formed in the operation for procidentia.

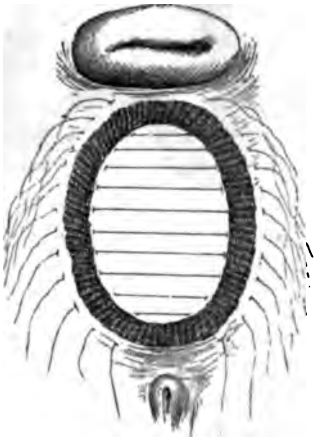
independent of the column to be afterwards formed from the tissues turned in along the anterior wall. Completion of the operation, after having fixed by this means the position of the cervix, is very simple. Fig. 62 shows the formation of two folds on the anterior wall, in the shape of an ellipse, extending from the surfaces secured in front of the uterus nearly to the vaginal outlet. This excess of tissue is to be turned in by finding, with tenacula, from time to time, opposite points near the crest of each fold, which can be brought together without tension. With the object of preventing any unnecessary loss of blood, but half an inch on each side need be denuded at a time, into which the sutures are to be introduced and secured. Thus advancing step by step, complete the operation by turning in these folds, until at length they become lost on the vaginal surface near the neck of the bladder. From four to five sutures should be inserted to the inch, a silk loop being passed first, to which the silver suture is to be attached for the purpose of drawing it through. The needle should be introduced so as to include a liberal amount of tissue, and the sutures twisted only just sufficiently to bring the raw surfaces in contact, that strangulation may be avoided from the swelling of the parts. The sutures are usually removed on the eighth to the tenth day. No special after-treatment is needed, beyond keeping a self-retaining sigmoid catheter in the bladder until the parts have become well united. When, from any circumstance, the catheter cannot be retained, the bladder should be emptied every few hours, so that the weight of a quantity of urine may not be borne by the recently united surfaces. If it be necessary to empty the bladder on a bed-pan, a little tepid water should be thrown into the vagina immediately afterwards, for fear that some urine may have passed in; by this method its effects on the uniting surfaces would be neutralized. It is absolutely necessary to confine the patient to the recumbent position for two or three weeks.

Where the upper portion of the vagina only has become dilated from an enlarged uterus resting on the floor of the pelvis, I often operate for the prolapse in preference to using a pessary. The operation, in principle, is essentially the same as that described for the relief of procidentia. The line, however, formed from the turning in of the superabundant tissue, only extends for a short distance on the anterior wall, since but a limited portion of the canal is dilated. Frequently, not more than two or three sutures are needed, but the line must be extended until a point has been reached where the folds can be terminated on a common level with the vaginal surface. In other words, as only the upper portion of the vagina is dilated, ther will be less and less tissue to turn in, and the folds will graduall become smaller towards the vaginal outlet until, at length, they wi be lost or smoothed out, as it were.

When there is no laceration of the perineum, or dilatation of th vaginal outlet from rectocele, the operation described as applicabl for the anterior wall may be of itself sufficient to cure a partial pr cidentia. If, however, the posterior portion of the canal has bee involved, the uterus will gradually advance, and ultimately escap from the vagina. This it will do even after the operation has bee performed successfully in every detail as described. Unless ther exists a proper support below, no operation yet devised for the ant rior wall of the vagina can, of itself, prevent a prolapse of the uteru Under such circumstances, the sole purpose of such an operation is t increase the radial distance between the cervix and neck of the bladde Then, if the uterus cannot become retroverted, nor approach near t the symphysis, it will only prolapse in the circle incident to the radiu thus gained. If the outlet of the vagina be sufficient, the procidenti may become complete again very soon after an operation. Yet, suc an operation may have been a success, so far, at least, that the rel tive distance between the cervix uteri and the neck of the bladder, a gained by the operation, remained unchanged. While the radi distance between these two points is preserved, the base of the bladde will swing like a trap door, as if it were hinged under the pubes. I will advance with the uterus, as the latter is dragged down by th prolapsing posterior wall, to pass through the vaginal outlet as soo as this has become sufficiently dilated. This condition is commonl not appreciated, and the operative procedure is, in consequence frequently condemned, and unjustly. I will then repeat, that th prolapse may be relieved, in consequence of the increased radiu gained by the operation between the cervix and the symphysis pubi as a common centre, provided the lower portion of the canal remains i a state of integrity. When such is not the case no permanent benef will be obtained unless the perineum be closed and the rectocele r moved, if necessary.

The operation on the posterior wall for rectocele, as formerly pra tised, resembled closely, in general principles, the one already d scribed. The denuded surfaces extended from the fourchette upwar in the form of an ellipse, towards the cul-de-sac, and were continu out until the excess of tissue was turned in level with the vaginal wal The operation was a very difficult one to perform, from the want space, and the venous hemorrhage was frequently excessive. Besides, it so often proved unsatisfactory, that I finally adopted a procedure by which the rectocele might be removed and the perineum closed by a single operation. This will be fully explained in connection with the operation for laceration of the perineum.

Fig. 63.



Sims's operation for cystocele.

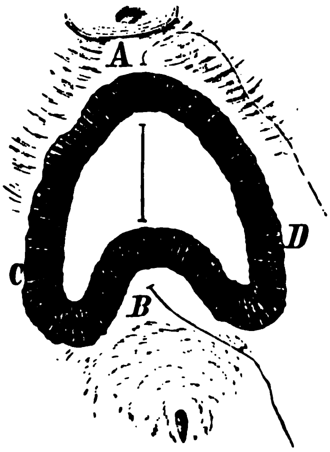
Cystocele is frequently met with in women advanced in life, when an operation on the anterior wall would be sufficient for its relief, without closing the perineum, although the loss of the perineum was the original cause of the difficulty. When, however, the procidentia did not become complete at the change of life, the prolapse of the anterior wall was not likely to be increased afterwards, as the then diminished size of the vagina afforded the necessary support.

For the relief of a simple cystocele, Dr. Sims's operation will be sufficient. This consists in the removal of a portion of the mucous membrane in the form of an ellipse, as shown in Fig. 63.

The patient is to be placed on the left side, and the speculum introduced. With a sound properly curved for two or three inches of its length, the excess of tissue can be pressed back in the median line towards the bladder, and thus held by an assistant. Two long folds will be formed, from which it will be now necessary to remove, with a pair of scissors, small portions of tissue along their crest, to serve as guides in the operation. When the tissues are again allowed to roll out, it will be easy to correct these points by removing the intervening strips of vaginal mucous membrane. These freshened surfaces are to be united by interrupted sutures along the median line, and secured in the usual manner.

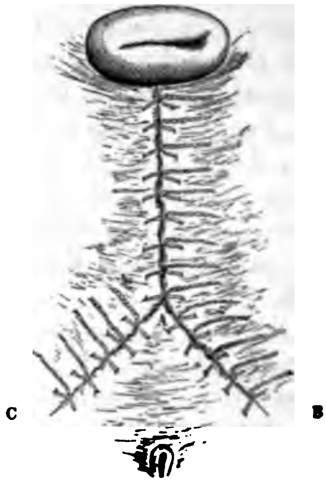
But, whenever the parts about the urethra have become prolapsed and thickened, this operation does not always answer. The difficulty is that it cannot remove this excess of tissue about the urethra, even if the line be extended to the meatus. Under these circumstances, I now remove the mucous membrane from the vaginal surface in the form shown in Fig. 64. Only a single suture is represented as having been introduced, so as not to confuse the demonstration. If this suture passing through the apex of each triangle were secured, the two points AB would be drawn together, and at the same time the flap B would carry with it the excess of tissue about the neck of the bladder. This would occur on account of the uterus being the least yielding point. The sutures would all radiate somewhat from the point B (Fig. 64), and, when secured, the line of union would form the triangle CAD. In this operation it is necessary to pass the sutures so as to include a liberal amount of tissue, and they should be allowed to remain *in situ* ten or twelve days. We aim to utilise the unusual amount of traction which is brought into play by this operation, to correct the prolapse. It is, therefore, necessary to take this precaution, since the sutures are very liable to cut out.

Fig. 64.



Emmet's operation for cystocele.

Fig. 65.



Position of the flaps.

For procidentia, with an excess of tissue prolapsing about the urethra, I adopt the same method, but somewhat modified. About two-thirds of the line, from the uterus forward, is united in the usual manner to the point A (Fig. 64). The operation is then begun by removing the tissue about the urethra. It is necessary, as a first step, to ascertain by means of a tenaculum how much of the tissue can be drawn up in the form of a triangular flap to the point A. When this flap has been secured, by twisting the suture AB, two folds will be formed on each side extending towards the inner faces of each ramus. With a tenaculum in each hand, we are to judge how much tissue should be turned in. Then, when the sutures have all been twisted, we will have the additional lines AB and AC, as shown in Fig. 65. This plan of operating disposes most effectually of all excess of tissue, and, when union has been obtained, the support is perfect, since it is exerted in all directions. But with all its advantages, one difficulty remains which I have never been able to overcome. In consequence of the traction exerted in opposite directions, the three flaps brought together almost always separate to some extent at the angle A after the sutures have been removed, and this necessitates a second operation.

CHAPTER XX.

LACERATION OF THE PERINEUM.

Effects of laceration—Mode of operating—Introduction of the sutures and securi the wires—Laceration through the sphincter—Mode of operating—Causes failure—Table XXXII., showing relation of laceration through the sphincter age, pregnancies, labors, etc.

THE importance of having the perineum intact, and its influence the healthy condition of the nervous system, is not fully appreciated When extensively lacerated and prolapse occurs, it is easy to reco nize an obvious cause of suffering. But we meet with cases comp cated by nervous disturbances, due, experience teaches us, to t existence of this lesion, but without prolapse, and, it may be so state without our being able to afford a definite explanation of cause a effect. This condition will sometimes be accompanied by a gener irritability, which cannot be traced to any other local cause, and only relieved by restoring the perineum. I have known of sever instances in which the existence of a scar on the perineum excited much reflex irritation as to entirely change the disposition of t woman, and yet she was not conscious of any local difficulty.

The perineum is liberally supplied with bloodvessels and nerve together with, I suspect, branches from the sympathetic system, sin these are so freely distributed to the neighboring erectile tissues. it be demonstrated that these parts receive such nerves, an explanati is found for the reflex irritation so often produced, and the presen of the cicatricial tissue is a sufficient exciting cause. That refl irritation may emanate from the perineum, as the effect of a loc exciting cause, cannot be questioned. It is a well-known fact th contractions of the uterus can be excited, during the progress of labor, by pressure on, or by stretching back, the perineum. Whe ever a laceration has been extensive, so as to have a dense cicatrici surface on the perineum, the most profound degree of anæsthesia ca scarcely allay the irritation excited by the necessary traction whi using Sims's speculum. I have been obliged to defer an operati for vesico-vaginal fistula, where the perineum was in this conditio although the patient had been fully etherized. For, as soon as th slightest traction was made by the speculum on the perineum, the patient would immediately stretch out to full length, and could not be held in position by force. I have been obliged to operate on these cases afterwards, the patient being under the influence of opium, and free to exercise her voluntary control.

When the perineum has been lacerated down to the fibres of the sphincter ani muscle, there remains no support to the uterus while the woman is in the upright position, except through the connective tissue and the utero-sacral ligaments. As she stands erect, with this condition, a perpendicular line from the front of the sphincter ani would pass through the posterior lip of the uterus or even behind it. The uterus is thus suspended over a constantly dilated and relaxed cavity, and with this state of things, it cannot surprise us that before a very long period, complete prolapse of the uterus will take place. Yet it is sometimes observed that, with extensive laceration, there exists neither disturbance of the nervous system nor any discomfort which could be attributed to a want of support. But these cases are certainly only the exception, while, sooner or later, they all come under the same general rule.

So long as the perineum exists in its integrity, the sides of the vagina lie in close contact, from being flattened laterally, and air is excluded. The sides of the canal are thus kept in contact, from their lateral attachment to the connective tissue of the pelvis, and the pelvic fascia is attached at the vaginal outlet just as the canal becomes joined with the labia. The upper and lower walls of the canal are thus brought together, the same as the sides of an elastic tube would be by making lateral traction with the fingers in a direction similar to that exerted by the connective tissue around the vagina.

In laceration of the perineum the ischio-perineal ligaments are divided, and the transverse perinei muscles and other attachments draw the sides of the vaginal outlet apart. The connective tissue of the pelvis can, therefore, no longer exercise the same support, nor in the same direction as before laceration, so that the canal remains patulous.

I am satisfied that the perineum is frequently lacerated on the vaginal surface, without the fissure extending through to the skin, and that this is done by splitting through a fold of vaginal tissue which may be found in advance of the child's head just before birth. This lesion, however, seems to extend deep enough to divide the central attachment of the ischio-perineal ligaments, with the effect of leaving the vaginal outlet flaccid and depriving it of its proper support.

The great discomfort which is experienced sometimes, even befor any prolapse has been detected, must be due to over-distension of th bloodvessels, the coats of which are no longer properly supported the sensation being due to increased pressure on nerve-fibres. This i a condition in itself likely to prove an important factor in displacin the uterus, in consequence of the increased weight, and by excitin tenesmus.

Whenever the perineum has been lacerated so that the proper degre of support to the vaginal walls is no longer exerted, there can be n doubt as to the necessity for an operation to restore the parts to thei original condition. There are cases, however, where a doubt as t this necessity may remain even after a careful examination. Afte the occurrence of the accident, and if the vagina, as has been described becomes a patulous canal, the air will enter, or be displaced from th passage, with every movement of the body. In case of doubt as t the propriety of an operation I question the patient in regard to thi circumstance: I always operate when I learn that, on suddenly turnin in bed, or on making any quick movement, the patient had observe the air to escape from the vagina, as flatus would from the anus.

I have already described at length, that the support of the perineu is essential to the cure of all cases of prolapse, and that no surgica procedure or mechanical resource will prove of permanent benefit s long as any degree of rectocele exists.

In my practice I have found it necessary to close the perineum fo one hundred and fifty-four women of the number who suffered fro the different stages of procidentia. To impress this fact I will stat that, of one hundred and eighty women having rectocele, cystocele, o complete procidentia, the perineum was closed by me (in addition t other operations) in all but twenty-six cases. Where the operatio had been deemed unnecessary, it was found to be almost entirel among those who had cystocele only, and after a change of life had already taken place previous to the operation.

For over twenty years I have been in a position where I could ob serve the value of each surgical procedure devised for the relief o these difficulties, and appreciate the changes brought about by time the most valuable test of all. This experience has taught me tha whenever the procidentia had been complete, the displacement recurred I believe, in every instance when the perineum had not been closed unless a change of life had already taken place. The longest instanc under my observation, before the recurrence of the procidentia, and where the support of the perineum was wanting, was about four years. I find that, even after carefully closing the perineum, as the final operation, the procidentia would soon return if the uterus was left retroverted, unless it so happened that the organ became bound down by adhesions. I observed also that there was a new condition, to be again referred to, which was left after the old method of operating for rectocele. This frequently reproduced the procidentia, by bringing about absorption of the perineum, and led me to adopt the operation which I will describe further on.

MODE OF OPERATING FOR LACERATION OF THE PERINEUM.

The mode of operating, as practised by Baker Brown and those who preceded him, was of no value for the purpose of giving support to the vaginal walls, since only the sides of the labia were united. By this method no connection was re-established, even indirectly, with the fascia and deep tissues of the pelvis. As a consequence, the soft parts, thus brought together, soon became stretched and thinned out, leaving the vaginal outlet as patulous as before. The quill and silk suture was in general use, and it was deemed necessary to divide the sphincter ani muscle, and, often lateral incisions were made into the soft parts to relieve the tension. In this tissue about the vaginal outlet it was impossible to regulate the degree of pressure with any even distribution along the quill, so that sloughing and erysipelas frequently occurred. With the use of silk in this vascular tissue, the formation of abscess was of more frequent occurrence than is now found to be the case with the metallic suture. Moreover, the division of the sphincter, and the incisions made into the soft parts, have proved to be unnecessary, and they complicate the after-treatment exceedingly.

Dr. J. B. Mettauer,[1] of Virginia, was, I believe, the first on record who employed metallic interrupted sutures in this operation; he used them with success as early as 1830. He somewhat modified the application of the leaden ligatures of Dieffenbach, and, I believe, did not divide the soft parts. Dr. Sims substituted the silver wire for the leaden wire of Mettauer in this operation, and this was certainly a great advance. He did not divide the sphincter, or think it necessary to make incisions to relieve the sutures, but in no other respect did his mode of operating differ from that generally practised.

On taking charge of the Woman's Hospital, in the autumn of 1862, I began a series of observations in regard to this operation, but more particularly for the condition involving the sphincter ani. I soon reached the conclusion to which every observer must arrive, that t gain the proper amount of support it is necessary to include a certai portion of the vaginal tissue. From that time until the spring o 1875, I included the posterior wall of the vagina to the level of th sulcus, in all the sutures, with the exception of the uppermost two which were used simply to bring together the sides of the labia. I have since then included a portion of the vaginal tissue in all th sutures. Previous to the spring of 1875, it had been my practice t employ a special operation for the relief of the rectocele. The exces of tissue was turned in along the median line, and secured by interrupted sutures until the vaginal outlet was reached, when the perineum was closed up to the terminal point of the previous operation If the one operation followed the other, several of the perineal suture were passed in the space between as many of the lower sutures use for closing the rectocele. But the prolapsing recto-vaginal septu could never be entirely disposed of by this method, for a more or les convex vaginal surface would always remain after the operation. I the diagram, Fig. 66, the dotted lin *A B* is to represent the portion of th posterior vaginal wall which was brough up behind the closed perineum by th sutures 1, 2, 3, 4, and 5, while the dotte lines *C* and *D* mark the direction of th two sutures which were passed onl through from one labium to the other The result of this operation was only o temporary benefit, a triangular hollo space was always left at *E*, just behin the new perineum, which soon became filled by a fold from above and this portion prolapsed as far as the barrier formed by the labi would permit. But so soon as one portion came down, its place woul be at once occupied by the tissue just behind it, so that the colum became gradually weakened. The perineum became overstretched and the original condition of rectocele or procidentia was in time, a a rule, gradually reproduced. The convex surface remaining on th recto-vaginal septum after this operation is a great source of weakne As a consequence of any downward pressure, this curve becomes increased, so as to bring the full force to bear against the newly-forme perineum. It becomes then but a question of time for absorption t take place, and the original condition to be reproduced.

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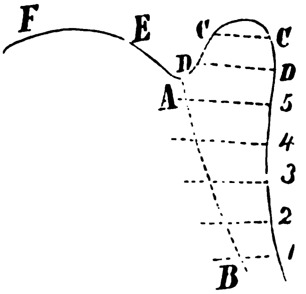
[1] Amer. Journ. of Med. Sciences, Philadelphia, 1833.

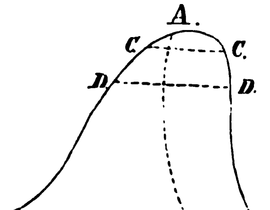
Fig. 66.



If, with a tenaculum, we were to catch up a portion of a clot table cover, and attempt to make traction, several folds would be formed. These folds would be formed on each side, and would lead off from the instrument to any point where the cover might be secured along the edge of the table, or to where a certain amount of friction had to be overcome. Now, in a case of rectocele, the tissues can be caught up in the same manner, and drawn towards the vaginal outlet. Unless the procidentia has been complete, so that the integrity of the whole posterior wall has been impaired, the amount of prolapse can be accurately appreciated by this method. It would, of course, be easy to draw down the whole posterior wall by exercising a sufficient amount of force, but we must not go so far as that.

The crest of the rectocele, at *F*, Fig. 66, represents the limit of the prolapse, and the septum above that point possesses yet sufficient integrity to remain in position when freed from the drag below. This will likely be the case, since the cellular tissue with which it is closely connected has not yet been overstretched. When this crest is thus drawn down to the vaginal outlet, we are able to trace with the finger these folds extending obliquely into the sulcus on each side, and we may judge by the yielding of the tissues as to the extent of the prolapse. As we make this traction in case of a rectocele, we can satisfy ourselves, by passing up the finger to the uterus, that the organ is not involved.

Fig. 67.



In the operation, the mucous membrane must be removed from over the whole surface, extending from the vaginal outlet to the crest of the rectocele. The uppermost suture *C*, Fig. 67, which formerly was made to include only the tissues of the labia, must now be introduced at *F*, Fig. 66, so as to draw down that portion, and obliterate the open space which was always left at *E*. After all the sutures have been secured, the line of union *A B*, Fig. 67, will show the direction in which the excess of tissue forming the rectocele was folded in. The effect has been to change entirely the shape of the vaginal wall, so that as the finger enters the canal it will pass at once along a concave surface. By this operation, the vaginal wall will have been restored to its original shape and size, with a firm perineum directly supported by the fascia and connective tissue of the pelvis. As this surface is now concave, no downward force can be exerted against the perineum, and the only effect of pressure so directed would be to increase the concavity, and to distribute the force along the floor of the pelvis. When only the proper amount of tissue has been turned in by the operation, this curved line may be compared to the surface of the bank of earth placed by an engineer on the upper side of a dam which he has thrown across a stream. Without this protection, if a simple wall were built, the whole force and weight of the volume of water would be concentrated against a point near the centre, which would first bow outwards, or bulge, before being swept away. But, if the engineer possesses a knowledge of the volume of water, which is to pass in a given time, and also its velocity, he will so shape this bank of earth, at the proper angle, that the force of the stream will be distributed equally along its surface, and the wall will be protected.

For the operation, the patient is to be placed on a narrow table, and while lying on the back, with the legs drawn up, the ether can be administered. But before commencing the operation, the night-dress and flannel must be drawn up to the waist, so that they may not become soiled. In the region of the coccyx, it will be necessary to place a sponge or a folded towel to collect the blood which will run down between the buttocks. Both legs must now be flexed on the abdomen, to be thus held by an assistant after the body of the patient has been drawn down to the edge of the table. One assistant must stand facing the operator on each side of the table. Such a position will enable each assistant to secure one of the patient's legs by passing his arm over the limb as it is flexed. This will leave the hands disengaged, and the nearest one can be employed to keep the labium on that side retracted. In separating the labia, the fingers of one assistant must be placed directly opposite those of the other. This is necessary, for if not on the same line, or if unequal traction be made, it would be difficult to avoid denuding the side of one labium higher than that of the other.

We may commence the operation by removing the mucous membrane from any point, but it is best to do so at the most dependent portion. We then advance from below upwards, and thus avoid the flow of blood over the surface to be removed. The mucous membrane is caught up on the point of a tenaculum, and with a pair of properly curved scissors, it should be removed in a horizontal strip running from side to side. If the operator is ambidextrous the whole surface may be removed in one continuous strip. By using a pair of scissors with a different curve to turn the point at one labium, we can extend the line back again upon the posterior wall of the vagina, from there to the opposite labium, and then over the same course again just above the preceding one. The first step in the operation should be to determine, by the method already described, the extent to which the denudation is to be carried on the posterior wall. This point we mark by removing, as a guide, a small portion of tissue from the median line. The advantage of the scissors in this operation cannot be questioned. With the utmost dexterity and quickness, the parts cannot be freshened and brought together without a great loss of blood. The amount of bleeding is less from the use of scissors, and with them the parts can be denuded in a much shorter time than with the knife.

I always use a thick, straight sewing needle, from an inch and a half to two inches in length, with a large eye for introducing the silk loop to which the wire is to be afterwards attached before being drawn through. I adopted the use of the straight needle after having devoted much time and thought in attempting to perfect some better means. If the curved needle with a handle, which is now in common use, be used, it is first passed through the tissues, and then the loop of thread is introduced into the eye at its point, and pulled through as the needle is withdrawn. The handle gives great control in directing the course of the instrument, so that it is readily introduced. I have also used hollow needles of different curves, having a handle, and equally well under control. But the one great objection to all of these instruments is the large size which is necessary to secure for them the requisite rigidity. If they were not rigid and unbending, it would be impossible, even with the aid of the handle, to direct their course with any accuracy.

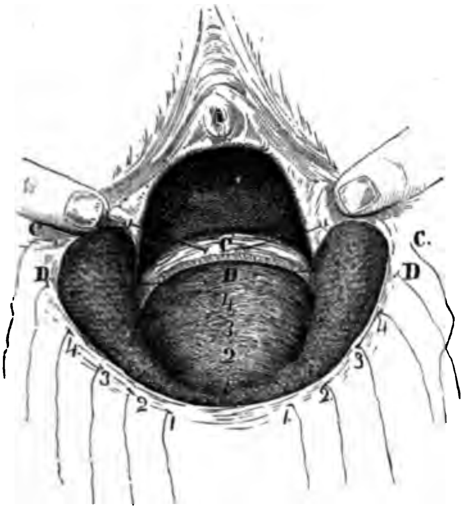
The tissues through which these instruments are to be introduced are exceedingly vascular, so that a thrombus is easily formed, and this generally terminates in an abscess. To avoid this difficulty—which is not a theoretical one—it is necessary to discard any instrument which has its point terminating in a flat cutting edge, and the diameter of the instrument should be reduced as much as possible, so that it may correspond somewhat closely to that of the suture. A straight needle, which acts like a wedge, and has its widest diameter near the eye, will alone present these advantages. The passage of the needle forms a canal by separating the tissues, and not by cutting them, so that the silver wire suture when introduced will fully occupy the opening. A needle with a curve near the point would possess some advantages at its exit from the tissues, but a curved needle will roll in the grasp of the forceps, so that its course cannot be directed with any certainty, and in order to secure the necessary strength it must be made greater in diameter than if it were straight.

The introduction of a straight needle through a semicircular course may seem difficult, but such is not the case, as the soft parts are so yielding. The index finger must be passed into the rectum to appreciate the course and facilitate the passage of the needle, and, at the same time, it will protect the posterior wall of the bowel from becoming transfixed. As the tissues of the recto-vaginal septum are thus lifted up on the point of the finger the course to be followed by the needle becomes nearly straight. If we introduce the needle into the left labium it is made to sweep in a curved line, with its point to the right, by pressing the jaws of the forceps into the soft parts just in proportion as the needle is advanced in its course. Then, when the median line has been passed by the point of the needle, its course is directed towards the point of exit by gradually rotating the hand to the left. As the point of the needle approaches the skin its exit can be directed, and the necessary counter-pressure be made by the thumb-nail alongside of the finger in the rectum. As soon as the point of the needle has been sufficiently cleared, by pressing back the tissues with the nail, it can be seized by the forceps and drawn through. The only special dexterity required in the passage of the needle is to properly rotate the forceps and wrist until the course of the point can be directed by the thumb-nail. The natural impulse is to overcome the resistance of the tissues, and to sweep the needle through the curved course by twisting it in the grasp of the forceps. The consequence is that the needle is usually broken just beyond the grasp of the forceps, and the portion already imbedded is often extracted with great difficulty. The plan is a good one to introduce the wire as soon as the loop of thread has been drawn through, since the oozing will occasionally be troublesome if we allow the silk to remain in the tissues for some time and then disturb it.

We may now briefly review the steps of the operation, by reference to the accompanying Fig. 68. The letter C is placed at the crest of the rectocele, in the same position as represented in the two preceding diagrams. It is shown that the surface has been denuded from the edge of the sphincter ani muscle up each labium to the remains of the carunculæ, and across on the posterior wall of the vagina to the extent of the rectocele. Suture 1 was introduced nearest to the edge of the anus, and its course through the recto-vaginal septum is indicated by the dotted line. The same explanation in regard to their course is applicable to the other numbered sutures.

The course of the suture D is shown on its exit from behind one labium to enter at D on the upper edge of the denuded surface over the posterior wall of the vagina. This is essentially the last suture introduced to secure this surface, and does not include more than an inch before it passes to the opposite labium. The course of the uppermost suture C is through the labium just in line with the limit of the freshened surface. It is then made to catch up a small portion of the vaginal tissue at C, beyond the denuded surface on the recto-vaginal wall, when it also passes to the opposite labium. Experience has demonstrated the advantage of going beyond the line, and of not including more tissue. Formerly, when this suture was introduced at D, along the upper edge of the denuded surface, and the parts were then brought together, the union was seldom complete. The edges were frequently pulled apart on carelessly introducing the catheter, from movement of the limbs, or from a certain amount of dragging backward from the weight of the posterior wall of the vagina. It was difficult also to protect the parts from urine, which would sometimes force its way in behind the flaps and prevent union. It is, therefore, intended that this suture should draw a portion of the vaginal tissue sufficiently forward to protect the edges, which have been approximated by the preceding suture. At the same time this suture plays even a more important part, since, by including the

Fig. 68.



Operation for lacerated perineum.

tissue beyond, it sustains all the traction until the denuded surfaces have had time to become firmly united.

The labia being convex surfaces it is not possible to give by a diagram the extent of tissue fashioned on their posterior face. The outline of the surface denuded for this operation may be compared to the figure of a trefoil. The cusps A and B, Fig. 69, are supposed to represent the labia, the surface's of which are divided, 2 2 being the posterior or vaginal side, and C would be the denuded portion on the recto-vaginal septum. When these parts are secured by suture, the points A, B, and C come together along the line dividing each section. The surfaces come then in apposition as they are numbered. 1 and 1 will represent the thickness of the labia, 2 and 3 the posterior portions united to corresponding surfaces on the recto-vaginal septum. This diagram, Fig. 70, represents the parts just as they are being brought up into contact, and may demonstrate in a clear manner the condition. A B and C are the points brought together, the figures 1 1, 2 2, and 3 3 correspond in position to same given in the preceding diagram. A 1 and B 1 show the thickness of the labia, and 2 C 3 the fold of the rectocele, drawn up behind the barrier, like a bank of earth behind the mill-dam as has been described.

Fig. 69.

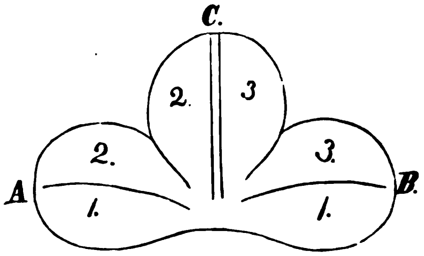
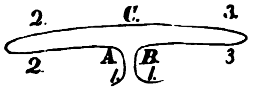
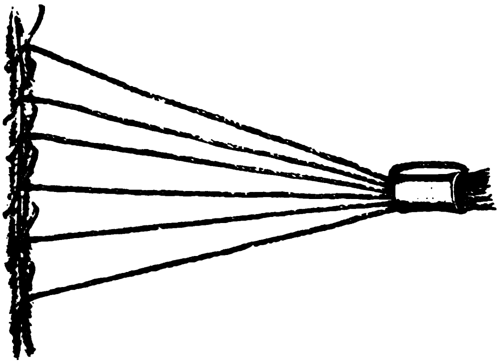


Fig. 70.



I have never found any necessity for using more than the one set of sutures, which should be passed deep to include a liberal amount of tissue. If these are properly introduced, and at regular intervals, superficial sutures will be superfluous. It is advantageous to have the silver wire for this operation a size or two larger than that in general use, since it gives a certain amount of support to the parts. I leave each twisted suture about three inches in length, and when the operation has been completed, I secure the ends of all of these together, like the radii of an open fan. These ends may be bound together by slipping over them a short section of rubber tubing (see Fig. 67), and then bending back the end of one of the sutures to keep it in place, or they may be wrapped by a short piece of wire with a little cotton over the ends. There is less risk of labial abscesses or accidental irritation of any individual suture by adopting this plan.

Fig. 71.



Method of securing the ends of the sutures.

After Treatment.—The patient must be kept in bed with her knees tied together and a soft pad between them. The urine should be drawn with care, to prevent it from running over the healing surfaces. This can best be done by flexing the legs over the abdomen, as at the time of the operation, but without removing the bandage from the knees. Then, with a strip of soft cloth covering the index finger of the left hand, the parts may be protected by placing this beneath the urethra as the catheter is withdrawn. The additional precaution should also be taken to close the end of the instrument by keeping the finger over it. A difference of opinion exists as to the necessity for using the catheter, and in regard to the deleterious effects from urine running over healing surfaces. I have been most anxious to dispense with the use of the catheter if possible, since this would be a great desideratum, but I have certainly gotten the best results when I have employed it; so that notwithstanding all the disadvantages I must advocate its use whenever it is practicable. The mere passage of fresh urine over a wound is not in itself a source of irritation, but it becomes so when stale, and when its salts are deposited on the healing surface. If the parts could be properly cleansed after the urine had been passed into a bed-pan, the use of the catheter might be dispensed with. But we cannot prevent a certain amount of urine from passing back into the vagina, and it is even likely to find its w between the tissues which have been brought together. But shou the urethra become irritable, or circumstances occur in which t catheter cannot be employed, it will be necessary to observe mo than the usual cleanliness. After the bladder has been emptied, a before removing the bed-pan, the nurse must throw a pint or more tepid water into the vagina. The nozzle of the syringe should carefully introduced close to the urethra, and during the administ tion of the injection, it is to be held in this position so as not to co in contact with the line of union. The parts can be greatly protect by the liberal use of vaseline, or some simple ointment of the prop consistency to remain on the surface. This may be applied for p tection not only over the labia, but along the line of union, and in t vagina, which is the part most exposed to the action of the urin The free application of the vaseline or cold cream over the labia w add greatly to the comfort of the patient by lowering the temperatu of the parts, and it should be used even if not needed to protect the As the bowels can be moved without materially disturbing the line union, nature may be allowed to take its course if the demand made, but the diet had better be regulated, if possible, to constipa the bowels for five or six days. Opium should not be used in a form, unless the necessity be very great, and even then it is well seek some substitute for it. The position of the patient may changed from the back to either side without injury to the sutures, long as the limbs are kept together. I direct the patient, beforehan to draw the limbs well up, and then have her rolled over on to t side by lifting up the mattress with the hands separated, grasping with one hand at the level of the shoulder, and with the other at t hips. By this simple plan a patient can be moved with very litt disturbance. If it be wished to change the position without turni her completely on the side, a bolster or several pillows may be plac under the mattress, so as to support the body of the patient at a angle. The parts will have become sufficiently healed by the seven day for the removal of the sutures. No advantage is to be gained leaving them for a longer time, but, on the contrary, there will risk from inflammation following some accidental injury. To remo the sutures, it will be necessary to place the patient on a table, a on her back, with the feet drawn up. As it would not be advisab to separate the parts to bring the loops into view, it will be necessa to trust somewhat to the sense of touch. We are first to remove t piece of tubing by cutting through the mass of sutures, which w free their ends. Then the lowest one may be grasped by a pair of forceps and gently turned to the right side, while the blades of a pair of sharp pointed scissors are passed down along the left side of the suture in search of the loop. We endeavor to get the loop between the points of the scissors, close to the twisted portion, and we can generally feel certain when this portion is within grasp. It is important to possess this knowledge, since it is an awkward accident to cut the twisted portion away, leaving the loop imbedded in the tissues, to cause much irritation and annoyance afterwards. We cannot always be certain that we have only caught up the loop, but, as a rule, when the points of the scissors are gently closed, we are able to appreciate, by the degree of resistance, between the single strand of wire and the twisted portion of double thickness. When the loop has been cut, the suture must be withdrawn from the tissues in a manner to cause as little irritation as possible, and without pulling apart the recently united surfaces. The suture must be drawn out across the labium to the same side on which the loop has been cut, and by doing so, each portion of the wire will continue to bind the parts together until its exit. The parts can be supported and also protected by an assistant pressing or holding the labia together until all the sutures have been withdrawn. For a week after the removal of the sutures, the limbs should remain bound together, then the bandage may be thrown aside, and only used at night for a short time longer. It should be the rule that the patient be not allowed to assume the upright position for two weeks, and, if the general health is not likely to suffer in consequence of a continued confinement, the additional rest of another week will be of advantage.

As the patient gradually returns to her every day life, her condition must be closely watched. On detecting the slightest tendency to retroversion, the position of the uterus must be corrected, and a pessary fitted to correspond to the altered condition of the vagina. If this precaution be neglected, and the uterus become retroverted, it will simply be a question of time before all will be lost and the original condition be reproduced.

Laceration through the Sphincter Ani, and the Mode of Operating for its Relief.—This subject naturally follows in connection with laceration of the perineum, since it is but an extension of the same injury. It is, however, without any necessary bearing on the study of procidentia, since advice is generally sought for early, and the injury repaired before sufficient time has elapsed for the case to become thus complicated. Both conditions are but different degrees of the same injury, and the same operation also, varying only in detail, is required for the relief of both. Therefore, even if the connection of a common cause did not exist, it would be essential to consider the modes of treatment together in order to avoid repetition.

Etiology.—In the accompanying Table XXXII, the record is given of fifty-three cases of complete laceration through the sphincter ani. These were treated in my private hospital, but constitute only a part of the total, as there were other cases of which the records were so incomplete, that they could not be utilized.

The first feature presented by the table is the early age of those who had sustained this injury several years before applying for relief. This fact is of more particular interest in comparison with the average age of those who suffered from the different stages of procidentia.

The average age of puberty is essentially the same as that found to be the general average for the women of the better classes.

The time of marriage is fully two years later than the average for those who suffered from cystocele or complete procidentia, while it is almost the same as that found for those with rectocele, who were treated in my private hospital. The average age at the time of marriage being also so much beyond the general average on all women, it is but natural to infer that this injury has some connection with marriage contracted late in life. Yet, on the other hand, but thirty-two per cent. of the total number, who suffered from laceration through the sphincter muscle, were found to have married after the age of twenty-five years.

The number of children borne by those who suffered from this injury, is about half the number credited to those who had procidentia in after life, and the proportion is about the same if made before the operation, or if taken on the total number.

The average length of time since the reception of the injury, and that since the birth of the last child, is much less than was the case with procidentia. Yet, the condition, as would naturally be supposed, does not seem to have been so great a bar to impregnation as the different stages of prolapse. The average age at the time of receiving the injury was twenty-seven years, being just five years less than the average for those who suffered from procidentia in its different stages. The proportion who were injured in their first labor was 77.35 per cent.

In regard to the method of delivering, thirty-three cases, or 62.11 per cent. were delivered by means of the forceps. This proportion was taken on the total number which included four cases when the condition of labor was not given. The proportion of unusually large

TABLE XXXII.—*Lacerations through the Sphincter Ani.*

	Age at the time of			Number of pregnancies.							Change of life.				Character of the labor when injured.							
				Before		After																
	Admission.	Puberty.	Marriage.	Children.	Miscarriages.	Children.	Miscarriages.	Total number of pregnancies and average number of children.	Length of time since receiving the injury.	Total number of years and average since last pregnancy.	Number and age.	Time in months and average in years.	Age at the time of injury.	Average labor by which the injury was received.	Not stated.	Rapid.	Tedious.	Forceps.	Turning.	Craniotomy.	Twins.	Large children.
Private Hospital— Number............	53	44	45	53	8	11	7	128	53	135	2	87	51	53	8	3	4	33	2	1	2	13
Average	31.15	14.18	23.40	1.75	1.12	1.54	1.28	2.41	4.03	2.43	45.50	3.50	27.01	1.73								

children was more than usual, and in every instance they were delivered by forceps. Craniotomy was performed in one instance, when the pelvis was very much contracted. Eighteen cases only of laceration of the cervix were noted, a number, I am satisfied, which future observation will show to be below the usual proportion.

Operation.—During the autumn of 1862, and in the following year, I investigated the use of the rectal tube. This instrument which was about equal in size to a No. 12 bougie, had been employed by Dr. Sims with the view of allowing free vent to the escape of flatus. Whenever the operation failed, leaving a recto-vaginal opening just behind the sphincter ani, it was generally attributed to stoppage of the tube from feces, while occasionally, it was suspected that the nurse, through carelessness, would force the tube into the vagina between the sutures. As I made myself familiar with the details, I became the more skeptical as to the necessity for the rectal tube, since it was almost impossible ever to keep it free. I began my experiments by substituting a short section of a solid rod the size of the tube. This was tied in and allowed to remain undisturbed for several days; the operation proved a success. I increased the size of the plug and succeeded in several more cases, but as the diameter exceeded that of the little finger, irritation was excited, and the operation failed. I next used a section of a copper sound, which was somewhat less than half the diameter of the original rectal tube. This small foreign body proved a great source of irritation, and the operation failed. For several years I was at a loss for an explanation, beyond the supposition that the tube relaxed the sphincter, yet, experience soon taught, as I have stated, that there was a limit beyond which any increase in size caused irritation. I concluded to use neither tube nor plug, and continued to operate until about the beginning of 1870 with varied success, unable, however, to offer an explanation for the success at one time, and failure at another. In a large number of cases, not a fibre of the muscle was united, although the perineum may have been restored, and the laceration through the recto-vaginal septum closed by the operation. To unravel the cause of failure, and to devise the means of obviating it, occupied my attention for years. To appreciate so simple a condition, as I shall explain, cost me more thought than I have ever devoted to any other professional subject.

Early in 1873, I published[1] an account of the cause of failure, and a new mode of operation, and I have now but little to add as the result of further experience.

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[1] Laceration of the Perineum, involving the Sphincter Ani, an operation for securing Union of the Muscle. N. Y. Medical Record, March 15, 1873.

When the perineum and the muscular ring forming the sphincter ani have been lacerated, a gaping triangular opening is left. The base of this opening is formed by the lacerated muscle, and the apex by the limit of the laceration through the recto-vaginal septum. For the convenience of demonstration we will describe the shape of the divided muscle. Gradually the fibres which formed the inner surface of the circle, when the muscle was in its integrity, will have shortened more than those on the outer margin which remain attached to the neighboring tissues, because muscular fibres always retract when they have been freed from their attachments. A glance at the diagram, Fig. 72, will show the corners of the muscle rounded off, and that

Fig. 72.

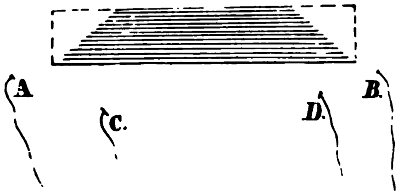
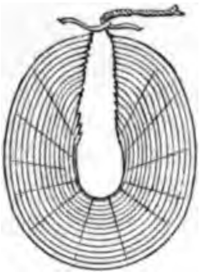


Diagram of ruptured sphincter ani.

the muscular fibres nearest the mucous membrane of the rectum have contracted more than the others. A convex surface is thus presented by the shortening of the inner fibres, and the muscle no longer resembles a parallelogram, which was the original shape just after it was ruptured. This shortening of the fibres of the muscle has hitherto been entirely overlooked, and to this cause must we attribute the failure to re-establish control over the escape of flatus and the contents of the bowels when in a fluid state. This must be the result if the operator only extends the denuded surface from above to A B, the apparent limit of the laceration, since but a small portion of the ends of the muscle can ever thus be brought in contact.

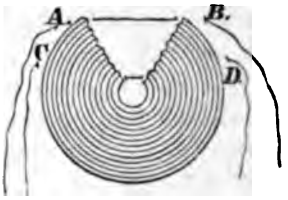
After the edges of the muscle have been properly freshened, the most important step in the operation will be the introduction of the first suture in its proper relation to the edges of the divided muscle. If the first suture be entered on the line a little outside of A B, Fig. 72, and at the point which would seem the most appropriate, only a small portion of the muscle will be approximated. Fig. 73 exhibits the condition of the parts when they have been thus secured by a sut entered from A B, and shows that the retentive power is not re-est lished. Introduce, however, the suture at some distance behind edge of the muscle at the points C D, Fig. 72, and a different result be obtained. A glance at Fig. 74 will show that on securing the sutu the divided edges of the sphincter will be turned up and brought perfect apposition. When the suture is passed from behind the ed of the muscle and around the laceration in the recto-vaginal septu the edges of the muscle will be turned up on tightening it. As t suture runs backward, obliquely across the rectal extremity, it see at first glance as if it were impossible that it could be secured with shutting up the anus. This, however, is not the case, for the e of the muscle are drawn upward on tightening the suture, wl passed above through the recto-vaginal septum, which, to a cert extent, is a fixed point. The actual position of this suture when twis is shown by Fig. 74 to be above the anus. As the rectum tu immediately backward into the hollow of the sacrum, the outlet is no manner encroached upon. When this suture is secured, its tende is to roll upward and outward the tissues from the rectum towa the vagina. One effect of this is of necessity to bring in cont below the edge of the laceration and throughout its course, a port of undenuded mucous membrane of the rectum. This suture, the fore, along the rectal portion acts as a safeguard in relieving second suture from tension. It is also a protection against the t dency of flatus to force a passage into the vagina. In my previ operations this second suture, passed on the same plane with the e of the laceration through the rectum, was the first and mainstay. then frequently noted, as the other sutures above were secured, t the tissues were forced downward. The effect of this was to spr

Fig. 73.



Faulty introduction of suture.

Fig. 74.



Proper introduction of sutures.

apart, as it were, the loop of this first suture, and then a large portion of denuded tissue became rolled out into the rectum. This was the cause of the frequent occurrence of a small recto-vaginal fistula at the thinnest point in the septum. This opening was generally situated just behind the sphincter, and was difficult to close on account of the constant action of the muscle.

The beneficial effect of the rectal tube, or of any other rounded body left in the anus, when the size of the instrument is not sufficient to act as a source of irritation, is now made clear. When, by accident, it so happened that the retracted fibres of the sphincter ani muscle were denuded, the presence of the rounded body aided greatly in the success of the operation. It, of course, could be tolerated in the anus only so long as the muscle was relaxed. Its action was to turn up the freshened edges, since it occupied a certain amount of space, and thus aided the sutures above in keeping these surfaces in contact. When the fibres were not denuded, no union of the muscle could take place, although the septum and perineum might readily unite.

The necessary position of the patient for the operation, with all other details, are essentially the same as described for closing a laceration of the perineum. The surfaces which have been lacerated, and are again to be freshened, are generally well mapped out by a slight cicatricial glaze. Under ordinary circumstances, unless sloughing has occurred, there can be but little difficulty in determining the extent. As the edges of the laceration through the septum have to be freshened with care, it is essential to commence the denuding from the most depending point, and by this means escape the annoyance of blood flowing over the parts.

If we examine carefully the extremities of the lacerated muscle, we will find a slight pit, or depression, at each end, which has been caused by the contraction of a portion of its fibres. It is necessary to freshen these surfaces, for by so doing we denude the ends of the muscle along the spaces between the dotted angles, shown in Fig. 72. At the commencement of the operation, a portion of the tissues at one of these points must be seized with a tenaculum, and, with a pair of scissors, removed together with a narrow strip entirely around the laceration to the opposite end of the muscle. This strip must be removed as close to the edge of the rectal mucous membrane as can be done without wounding it. Whenever the edges of the laceration in the recto-vaginal septum are found terminating in a thin bevelled edge, it will be necessary to gain the needed width by removing a sufficient portion of the vaginal mucous membrane.

Occasionally, the laceration through the recto-vaginal septum is found to terminate in a double cleft, one being much longer than the other. In this condition, success would be doubtful were we to confine ourselves only to the thickness of the walls of the laceration. Therefore, in addition, I always remove a sufficient portion from the vaginal surface beyond to include both fissures, and also, by way of compensation, in the opposite direction from these, so that when the edges of the freshened surfaces are brought together, they will meet in the median line as if a simple laceration had occurred.

The needle is to be introduced behind the edge of the muscle to the left, at the point D, Fig. 72. It is then made to sweep around the angle of the laceration in the septum to the point of exit at C, and this is done by gradually rotating the forceps with a movement of the wrist. As in laceration of the perineum, it is necessary that the index finger of the left hand be introduced into the rectum to serve as a guide. As the point of the needle punctures the skin in its exit, the finger may be withdrawn from the rectum to aid the passage of the needle. This can be done by the counter pressure of a blunt hook, or by sliding back the tissues sufficiently with the fingers, for the needle to be seized by the forceps and drawn through. The second suture is to be introduced just outside of the end of the muscle, and in the same plane with the divided rectal edge of the laceration. The third suture is to secure the vaginal edge of the laceration. It should be made to include the tissues liberally, and to sweep around the angle of the laceration at some distance beyond the course of the first and second suture. This is necessary because this suture is the one most liable to cut through the recto-vaginal septum and leave a fistula. The other sutures are to be introduced as in a case of simple laceration of the perineum.

It is necessary to secure first the lowest suture C, D. This is done by seizing the ends of the wire at a proper distance, so that the index fingers may be used to slide the tissues firmly down on the suture, as moderate traction on the wire is made at the same time with the hands. The suture is then secured without relaxing the traction, by several half turns made on reversing the position of the hands from one side to the other. Each suture is thus in turn secured from below upward. Experience can alone indicate the proper amount of tension to be made, and success will depend, to a great degree, upon this manœuvre. The parts should be just brought in apposition, and no more, for in a few hours there will be sufficient swelling to force the tissues in close contact. If the sutures have been twisted too tightly, and especially if they have been introduced in too superficial a manner, they will cut out from behind forward. This will leave a fistula, or the tissues in front will become sufficiently strangulated to set up some inflammatory action, resulting afterwards in a labial abscess.

The twisted sutures are to be left several inches long, and are to be secured by the same method as when used for simple laceration of the perineum. I have met with but few instances where the laceration was so extensive beyond the sphincter, that the whole extent of the fissure could not be included within the deep sutures passed as I have described. When the exception has occurred, the difficulty was easily obviated by denuding the edges, and bringing them together by a sufficient number of interrupted sutures down to the edge of the sphincter ani. These sutures were introduced at a sufficient distance apart (the same as for bringing together the edges of a fistula), then twisted, bent over flat to the vaginal surface and cut short. The after-treatment will differ but little in detail from that already described.

When the nurse is an inexperienced one, I have the patient's bowels moved by castor oil on the sixth day, and remove the sutures the day afterwards. But, if the nurse has been accustomed to the charge of such cases, I withdraw the sutures at the end of a week, and have the bowels moved a few days later, since trained nurses learn to support the parts with their fingers while the bowels are acting, so as to relieve the recently united surfaces from all strain. It is a good plan to have a small quantity of warm olive oil gently thrown into the rectum just before the bowels are moved. After the sutures have been removed, and by the method already described, the bowels must be constipated for six or seven days by regulating the diet, and by the administration of opium, if needed, in sufficient quantity to keep them quiet. The knees are to be kept tied together for several days after the removal of the sutures, and always at night for some time longer. The circumstances of the case, particularly the extent of union, will indicate the proper time when the patient may be allowed to sit up.

It is yet a mooted question how soon after the injury the operation should be performed. When the laceration has extended through the sphincter, my conviction is that in every instance, when it is possible to do so, the parts should be brought together immediately after delivery. It is true, observation has taught us that the lochial discharge is poisonous to a healing surface, yet a large number of these operations would be successful with a little additional care. The operation just after delivery would then be comparatively a simple one, and it would be unnecessary to pass the suture behind the muscle. Something would be gained in every case, and support would be given to the uterus, for a while at least, until it had become somewhat reduced in size, and time gained for the overstretched vaginal tissues to recover their tone. A week even thus gained in giving a proper support to the parts may be the means of saving the patient from the necessity of undergoing treatment for months. This she may be spared, even if the operation itself should prove a failure.

The condition of the patient after delivery may be too critical to admit of the additional operation for bringing together the edges of an extensive laceration through the septum. Under these circumstances, I should deem it advisable to introduce the deep perineal sutures, to include as much of the septum beyond the muscle as is possible. These sutures can be rapidly introduced, and without any special care beyond including a liberal amount of tissue. If a union of the perineum is thus gained, with a portion of the septum beyond the sphincter, but a small recto-vaginal fistula will remain. This may prove a discomfort, but its closure can be safely deferred.

I am in the habit of closing this little opening by dividing the perineum and sphincter ani by means of a pair of scissors. Then the edges of the opening can be thoroughly denuded, a procedure otherwise very difficult. The parts can then be brought together and treated in every respect as if it were a case of laceration in which the surfaces had just been freshened.

I have several times closed such an opening, after denuding the edges, by passing the sutures around the fistula from the perineum. With the finger in the rectum as a guide, a suture was passed so as to close the edge on the rectal side, and another above for the vaginal border. The lower suture includes so much of the sphincter ani muscle, that its action in the upper part is controlled. By this means the fistula closes, a result which is almost impossible to be obtained under ordinary circumstances, since the outer fibres of the muscle form one side of the fistulous opening.

When an operation cannot be resorted to immediately after the injury, the knees should be kept tied together, the urine properly drawn, and the greatest care given, by cleanliness, to free the parts from irritation. At the reception of the injury, the rent through the septum is more extensive than after the edges have cicatrized; therefore, if proper care be taken, by frequent injections of tepid water, to keep the parts free from irritating discharges, the edges will unite to within a short distance of the sphincter. Before the patient is allowed to assume the upright position, some mechanical support must be resorted to for the purpose of lifting the uterus from the floor of the pelvis. The effort must also be made to keep the organ partially anteverted, so that there may be no prolapse of the vaginal walls.

After the woman has recovered her strength, if the child has been stillborn, the operation should be performed without further delay. For the welfare of the child, if the mother nurses it, the operation should be deferred until it is old enough to be weaned with safety. But, at the same time, we must take into consideration the condition of the mother, as to how long she may be safely subjected to the delay, care being had always to keep the uterus well supported.

CHAPTER XXI.

INVERSION OF THE UTERUS.

Causes — Frequency — Symptoms — Diagnosis — Treatment—Method of Valentin, White, Tyler Smith, Noeggerath, Courty, Simpson, Barnes, Nott, Emmet.

INVERSION of the uterus is a condition in which the uterus has become either partially or completely turned inside out, so that more or less of the inner surface forming the uterine canal projects through the dilated os into the vagina. The injury results from childbirth, or from the growth of some interstitial tumor which had already begun to project into the uterine canal.

Dr. West[1] makes the following statement: "No instance has come under my observation of uterine inversion in the recent state, and, indeed, the annals of the Dublin Lying-in Hospital, and those of the London Maternity Charity, sufficiently illustrate the rarity of the accident, since it was not once met with in a total of more than 140,000 labors." The accident is, therefore, comparatively a rare one.

It has become a tradition in the profession, that inversion of the uterus is in some manner always due to traction made on the umbilical cord in the delivery of the placenta. Under certain circumstances, and from the employment of great force, it is possible, with the placenta attached directly at the fundus, that inversion may sometimes take place, but I believe the injury is rarely due to this cause. If it were due to this cause, the lesion should be a more common one, as the result of all the pulling upon the cord which has been employed, down to the present day, by all the old women to be found both within and without the profession.

Schroeder[2] offers the following explanation: "Inversion is doubtless brought about in this way—the uterine foundation, or base of the tumor, which consists of normal uterine tissue, becomes atrophied (either disappearing or undergoing fatty degeneration) by means of the pressure which the tumor exerts. A gap is thus formed in the firm contractile uterine tissue; the tumor sinks into the cavity of the womb, and is driven towards the mouth both by its own weight and by the contractions of the organ. The os then opens, and the tumor sinks into the canal of the cervix, and thus the adjacent portions of the uterine wall being drawn down, a complete eversion is gradually accomplished. In some cases, however, after the tumor has sunk a certain distance into the cavity of the uterus, the inversion is rapidly accomplished by means of uterine contraction."

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[1] Lectures on the Diseases of Women, p. 231.

[2] Ziemssen's Cyclopædia, vol. x. p. 215.

These views are unquestionably correct, and are in accordance with my own observation. By reference to the chapter on fibrous tumors in this work, essentially the same explanation will be found as was offered by me several years ago, in reference to the method by which tumors become pedunculated. During an operation on a case in March, 1874, with my hand in the uterus I was able, for the first time, to appreciate accurately the process. I then advanced the opinion, and have frequently advocated it since, that inversion of the uterus resulted in the manner described, by irregular and segregate contractions of the muscular tissue.

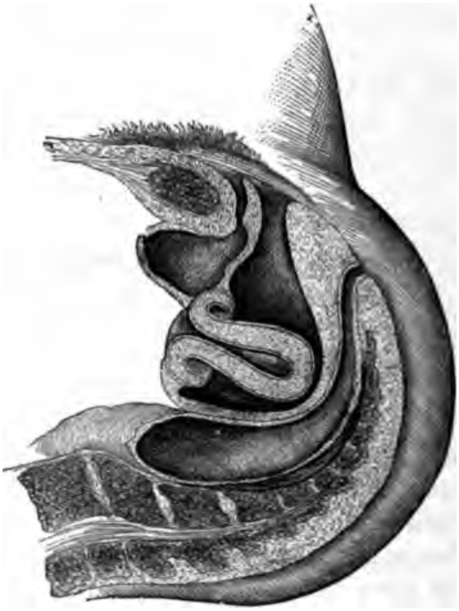
As a rule, inversion takes place between the birth of the child and the delivery of the placenta. It is marked, generally, by symptoms of sudden shock and hemorrhage, but out of proportion to the actual loss of blood, which, although often free and continuous, is frequently not detected before the collapse. The contractions of the uterus afterwards are often violent, and cause much suffering from reflex irritation of the bladder and rectum. Under other circumstances the accident has been attended with so little disturbance that the question may remain an unsettled one as to the exact time of its occurrence. Cases of this description have been reported where the inversion was supposed to have taken place days after delivery, and others where the condition was only detected by accident, presenting no symptom of disease other than a watery discharge or a leucorrhœa.

An inversion of the uterus is, however, generally accompanied by a constant oozing of blood, which eventually produces a most profound degree of anæmia. There will be an inability to exercise, and in some cases œdema of the face as well as of the extremities. On assuming the upright position, nausea or vomiting is frequently excited, with palpitation and irregular action of the heart, all of which symptoms are due to the loss of blood. Instances have occurred where women have had the vitality to resist the consequences of inversion of the uterus for twenty or thirty years, until, at length, with a change of life the drain has ceased.

There can scarcely be any difficulty, just after an inversion, in forming a diagnosis when resulting from childbirth. The uterus at this time is generally large enough to project from the vagina, and frequently has the placenta still adherent to it. But after the uterus has contracted to nearly its natural size, it may become a difficult matter to make the diagnosis between an inversion and a pedunculated fibroid.

Fig. 75 illustrates the usual condition existing with the inversion of the uterus to the vaginal junction, the fundus being seen projecting into the vagina through the ring formed by the dilated cervix.

Fig. 75.



Inversion of the uterus.

In this instance the use of the sound would indicate, under ordinary circumstances, the condition, since it could only be introduced between the mass and the cervix, to the same depth on all sides. But occasionally other lesions are met with which might mislead and render a diagnosis doubtful. Several instances have occurred in this city, and many others are on record, where the mistake has been made in removing an inverted uterus for a supposed polypus. It is, therefore, most important to determine accurately the true condition, and always to treat the case as one of inversion so long as any doubt exists, otherwise a simple operation for the removal of a polypus may, in an inversion of the uterus, prove a fatal error.

I have myself tightened the chain of an écraseur around the pedicle of a supposed polypus, which was attached to the fundus at a distance of over two and a half inches from the cervix, where, on further investigation, the case proved to be one of inversion. In this instance the uterus was enlarged, and a fibroid at the fundus, which had caused the inversion, stretched out by its weight the body to such an extent that it was not larger than the index finger, thus giving it every appearance of being the pedicle of a fibroid. Then, to add to the deception, the sound passed to a natural depth alongside of this mass into what was supposed to be the whole uterine canal. The diagnosis was not settled until, by means of the chain of the écraseur, the mass had been drawn down to the vaginal outlet, when, on passing the finger into the rectum, the indented portion at the seat of inversion was distinctly felt. This could not be reached before, or detected through the abdominal wall, on account of the thickness of the adipose tissue.

Within a few days of writing this article a case was under observation at the Woman's Hospital, where the existence or not of an inversion could not be determined. The woman was very fleshy, there was scarcely any pedunculated shape in the mass, and at one side only could a sound be introduced to a greater depth than an inch, beyond which, for some two inches and a half, it seemed to pass only into the opposite horn of the uterus. I had made a diagnosis at first of a polypus, but on a further examination the case seemed to be one of inversion commencing at the right horn of the uterus. I attempted for an hour and a half to reduce it, but without success. After an interval of a week I passed a slip-knot of tape high up around the mass, by introducing the hand into the vagina, and by this means gently drew it down to the outlet. I now discovered a difference in the character of the tissue covering the mass, and as no constriction could be detected by examination through the rectum, the probabilities were in favor of a fibroid. After some difficulty, I enucleated a tumor nearly as large as a hen's egg, which had been crowded out from the uterine wall, and with it a thick layer of uterine tissue covered by mucous membrane, so as to present all the appearances of an inversion.

Some years ago, the late Dr. Henschel exhibited, to the New York Obstetrical Society, a specimen of polypus which projected into the vagina, and had become adherent all around to the sides of the cervical canal, so that a probe could not be passed in any direction.

Dr. Sussdorff, of this city, has reported[1] a case of hollow polypus which was attached in the same manner, and to increase the difficulty of diagnosis, the uterus was afterwards found completely retroverted. This condition could not have been detected under the circumstances, without taking the precaution of introducing a finger into the rectum and another into the vagina at the same time. Unless adopting this method, the retroverted uterus, as felt from the rectum, would naturally be mistaken for the tumor in the vagina, and in the absence of the uterine body from the relative position it should occupy, the diagnosis of inversion of the uterus would be a natural one.

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[1] Am. Journ. of Obstetrics, etc., Oct. 1877.

It has been stated that pain could be excited by grasping the mass if it were an inversion, while the contrary would be the case with a polypus. This I have noticed in several instances in which also contraction was excited, but with other cases the uterus had become as little sensitive as a polypus.

Under ordinary circumstances the existence of an inversion can be determined by the history of the case ; by the absence of the uterine body from its natural position, as shown by the facility with which a sound in the bladder and a finger in the rectum may be approximated at that point; and, beyond question, on detecting the cavity formed at the seat of inversion; and by using the probe to ascertain the depth of the uterine canal.

Treatment.—Unless the accident were recognized early enough after labor to return the fundus before the organ had contracted, there existed, until recently, no other practice but the removal of that portion of the uterus projecting below the point of inversion. I may be trenching somewhat on the province of the accoucheur in treating of an inversion which has just occurred, but unless I do so the history of the lesion will be scarcely complete.

When inversion takes place, with the placenta still attached, the question may arise as to the proper treatment. While all authorities would agree as to the necessity for an immediate reduction, there may exist a difference of opinion as to the removal of the placenta through fear of hemorrhage. To attempt the reduction with the placenta attached would prove a very difficult procedure, and even were the necessity greater for doing so, the loss of time which it would necessitate, in consequence of the contraction, might well be advanced as a serious objection. The fear of hemorrhage, however, I suspect is based entirely upon theoretical views, drawn from false premises, since the uterus could not become inverted unless from contraction, and this condition is not one favorable to a prolonged loss of blood. The uterus continues to contract rapidly afterwards, and the great fear lies in the loss of time which may thus render the reduction difficult. I advocate the removal of the placenta, and the immediate carrying up of the fundus to its proper position, when possible, by introducing the hand into the vagina. The uterus in this state will at times contract violently, and then become relaxed. If the uterus should have already become much reduced in size, it will be impossible to return the fundus while the organ is in the state of contraction. It will first be necessary to indent some part of the fundus, in the interval of relaxation, and this portion may be then rapidly carried up on the point of the finger. While the reduction is progressing, a bed-pan can be placed under the hips, and a basin of hot water procured. Then the operator, without removing the hand, may, with the other, introduce the long nozzle of a Davidson's syringe within the uterine canal. The injection of hot water will certainly excite reflex action, so that the bleeding, if it should exist, will be arrested, as in post-partum hemorrhage, and after reduction, the inversion cannot again take place, in consequence of contraction of the whole uterus.

Not being in obstetrical practice, I have never, myself, tested the action of hot water in such a case. But I have no doubt of its value, since I have for more than ten years urged in my clinics and among my friends its use in post-partum hemorrhage, to bring about the usual condition of contraction. The remedy is certainly most efficacious for the purpose, if it be properly applied within the uterus, at a high temperature, and in sufficient quantity.

I can, beyond question, claim the credit of having first recommended its use for this purpose, based, not upon theoretical views, but upon actual practice. I had already, for years before, been familiar with its action in exciting uterine contraction whenever I removed a tumor from within the uterus.

As already stated, the condition was regarded as a hopeless one after the uterus had once contracted, and from the practice of Ambrose Paré down to the present generation the ligature was the only resort, with or without the aid of the knife afterwards. The late Dr. Charles D. Meigs, of Philadelphia, in his Letters[1] to the students of his class in 1846, wrote: "You might as well try to invert one of the non-gravid uteri on my lecture-room table as to reposit this one—the time is gone by." He had reference to the possibility of restoring the inversion after the organ had contracted. Yet he cites two cases which occurred in his own practice, of spontaneous recovery, followed by pregnancy, where his diagnosis as to the inversion had been confirmed by Prof. Hodge and Dr. Warrington. No reasonable doubt could be advanced, as to the correctness of the diagnosis, by any one familiar with the skill of these gentlemen. Dr. Meigs, in his work, refers also to other similar instances, but they are not from so authentic a source, and the question of an error of diagnosis might be raised.

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[1] Woman: her Diseases and Remedies.

A number of cases of inversion of the uterus have been reported to the medical journals, and others are to be found in the earlier works, where the accident had been recognized and the reduction accomplished almost immediately after the occurrence. The uterus is generally well contracted in twelve hours, and with many cases it would be then quite as difficult to effect a reduction as if a year had elapsed. Nevertheless, I have found on record that Dr. Eb. Skae,[1] of Edinburgh, in 1845, reduced the displacement twelve hours after its occurrence, which followed a miscarriage at four months. In consequence of the inversion from a miscarriage this case is notable. In 1847, Dr. E. H. McCoy, of Harrisville, Ohio, reported[2] a case he had reduced two days after delivery. This case seems to have been the first reduced in this country after so long a delay had intervened from the delivery.

The publication of M. Valentin's case (*Revue Medico-Chirurg.*, Nov. 1847[3]), showing that he had succeeded in reducing the uterus sixteen months after it became inverted, established the operation as a feasible one, and afforded a definite plan of procedure. After describing the mode of delivery (which occurred April 8, 1846) and the condition of the woman for a year afterwards, his method of reduction is given as follows: "After several months devoted to the recruiting the strength, on the 15th of August, 1847, the vagina was dilated by sponge tents, and the female was placed on the edge of the bed, as for the application of forceps. The left hand of the operator then grasped the hypogastrium, the uterus itself was seized by the fingers and thumb of the right hand, and pressure made; but the screams of the patient caused the operation to be for the time abandoned.

"On the 26th another attempt was made, with the aid of ether inhalation. The patient being rendered insensible, the same manipulations were gone through with, but, as before, the uterus was altered in form, without the fundus yielding, as was wished. The attempt was persisted in for ten minutes without progress, when etherization was carried to the extent of reducing relaxation of the sphincters. At this moment the collapse of the system was complete, and, the uterus partaking of the relaxation, the fundus allowed itself to be depressed under the finger, until, at length, it became suddenly restored to its normal state."

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[1] Ranking's Abstract, American edition, January, 1847.

[2] American Journal of the Medical Sciences, July, 1847.

[3] Ranking's Abstract, American edition, January, 1848.

Dr. S. W. Merriman reports[1] a reduction performed by M. Barrier, of Lyons. Chloroform was used, and very much the same method was employed as that given by Valentin. The duration of the displacement is not stated, but the inference is that it was about eighteen months.

Mr. George Canney, of Bishop-Auckland, gives[2] another successful case, after five months' inversion. The same plan of reduction was followed, chloroform being also employed.

To the late Dr. John V. Quackenbush, of Albany, N. Y., is doubtless due the credit of having been the first in this country to reduce a chronic inversion of the uterus. He is even entitled to greater credit, since, as I have been informed by himself, at the time of operating he regarded the procedure as original, and was ignorant of the success of Valentin and others before him. The reduction was performed by Dr. Quackenbush April 29, 1855, and reported to the New York State Medical Society February 3, 1859.

The next to make the attempt in this country was Prof. James P. White of Buffalo, who operated March 12, 1858, and reported the case to the Buffalo Medical Association in the following April.[3] The inversion had existed for fifteen years. Dr. Tyler Smith, of London, operated for the first time in 1856, but his report of the case was only made to the Royal Medical and Chirurgical Society, April 13, 1858. In this instance, the inversion had been of twelve years' standing. Dr. Noeggerath, of New York, reported a successful case in the *American Medical Times*, 1862, which had been of thirteen years' duration. Since this time the operation has been generally accepted by the profession, and the number of successful cases, both in this country and abroad, has rapidly increased. As a consequence of increased experience, no operator of the present day would abandon any case on the plea of being irreducible. Prof. White has operated, and with success, on a larger number of cases than any other member of the profession.

Since no one method yet proposed is applicable to the reduction of

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[1] Medical Times and Gazette, Sept. 4, 1852.

[2] Ibid., Sept. 18, 1852.

[3] American Journal of the Medical Sciences, July, 1858.

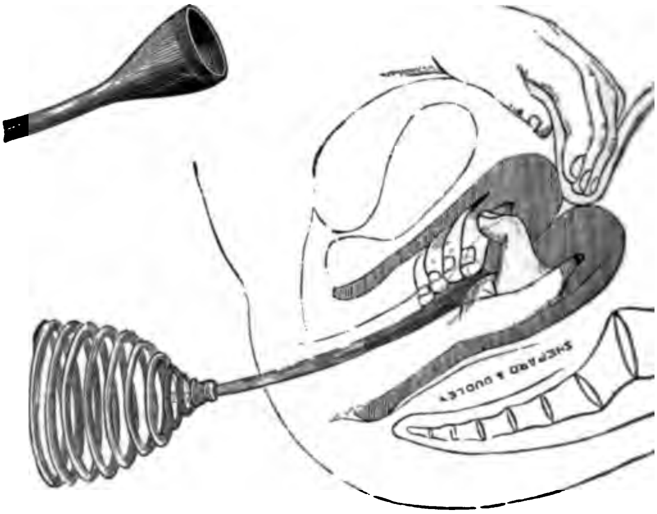
every case, various expedients have been resorted to under t
ent circumstances.

Preparation for the Operation.—Under all circumstances
tents of the rectum and bladder must be removed before com
the operation. An anæsthetic is indispensable. The positi
seems to have been universally settled upon as the best for th
tion is that on the back, with the lower limbs drawn up and
the abdomen, and thus held by an assistant standing on e
The hands of the operator must be thoroughly washed and
in warm water. One hand, with the forearm bared and well
is carefully passed into the vagina, to execute any special man
decided upon, while the other hand is to be employed for s
the uterus by making counter-pressure above the pubes.

Valentin's method has already been described, and is the o
would naturally be suggested. Dr. Quackenbush, in his c
ployed essentially the same plan.

White's method.—One hand is introduced into the vagina
double purpose of grasping the inverted portion of the uterus

Fig. 76.



White's Repositor.

the same time, keeping pressed against the fundus an Indi
cup, from which, projecting outwards, is a short staff, havi
other end a stout steel spiral spring (see Fig. 76). This sp
a pad at its extremity (not shown in the figure), and is int

rest against the body of the operator, so as to maintain a steady pressure. The effect of this is to put the vaginal canal on the stretch, so that by traction on the walls the ring at the seat of inversion above may be dilated. The other hand is employed to steady the uterus, and, at the proper time, to aid by making counter-pressure, with the view of rolling out the tissues at the seat of inversion.

Tyler Smith's method was to mould and compress with the fingers the inverted portion of the uterus every night and morning for ten days, and then to keep up steady pressure by fully distending the vagina with an inflated India-rubber bag. At the end of a week it was found that the uterus was returned to its normal position.

Noeggerath's method consists in compressing the body of the uterus, opposite to each horn, between the thumb and finger, so as to indent it on one side or the other. When this can be accomplished, the indented horn of the uterus is crowded like a wedge into the canal formed by the inversion, and it is then soon followed by the remainder of the fundus and whole body of the uterus. This plan has been attended with success in several instances to my knowledge, and it is particularly applicable for recent cases of inversion.

Courty's method, as described in his work, was in one instance successfully employed after other means had failed. The uterus was drawn down by a vulsellum to the vaginal outlet, two fingers were then passed into the rectum and separated so as to hook over the mass on each side of the seat of inversion along the utero-sacral ligaments. Firm pressure was now made with the other hand in the vagina, by grasping the pedicle or body of the uterus, and pushing it backward. The mechanical effect would be exerted with little loss of force, since the fingers in the rectum steady the uterus, and, from their position, aid in rolling out the edges at the seat of inversion as the body is being crowded up from below by the hand in the vagina.

Simpson's and Thomas's Method.—According to Dr. Robert Barnes,[1] "this consists in making an incision through the abdominal wall so as to get at the constricted os uteri from above, and then applying a dilating force. The idea was enunciated by the late Sir James Simpson at the discussion of my paper before the Medico-Chirurgical Society in 1869." Dr. T. G. Thomas, of New York, has been bold enough to put this suggestion into successful practice in two instances, with the result of death from peritonitis in one of the cases. From a conservative stand-point, I should not advocate the practice. Dr.

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[1] American edition of his work, page 632.

Thomas frankly states that the abdominal section "is not offered as a method for treating inversion of the uterus, but as a substitute for amputation."

Barnes's Method.[1]—In 1868, Dr. Barnes, having failed in the reduction by Dr. Tyler Smith's plan, drew down the inverted uterus to the vulva by a slip-knot of tape. "I then," he says, "made three incisions in the neck about a third of an inch deep, one on each side, and one behind in a longitudinal direction, that is, across the fibres of the cervical sphincter. Then, compressing the uterus with my left hand, and supporting the os uteri by the fingers of the right hand through the abdominal wall, I found the cervix yield, and the body went through into its place. The cervix yielded by laceration extending from the incisions, and I very much feared at the time that serious, if not fatal mischief had been done. No material inconvenience, however, followed; an examination three weeks afterwards showed the cervix and uterus to be in their proper places. Notwithstanding the successful issue, I believe that the method should only be resorted to after a full trial of Tyler Smith's plan, and then with great caution. I should recommend that only two incisions be made, one on each side of the os, and these of moderate depth." This operation has been put in practice by Drs. Sims and Thomas, and Sir James Simpson also recommended it. With the greater number of cases the hemorrhage, as in Dr. Thomas's case, must be excessive, and the procedure should not, therefore, be adopted except as a last resort.

Watts's Method.—Recently Dr. Robert Watts of this city, has succeeded in reducing a case of inversion at the Roosevelt Hospital in the following manner. He first drew down the uterus so as to make it protrude partially from the vaginal outlet, and then passed two fingers into the rectum, as in Courty's method. But, instead of using the fingers in the rectum simply for counter-pressure, he placed a finger in the depression formed at the seat of inversion. Then, by means of the hand grasping the uterus at the mouth of the vagina, the organ was gradually pushed down on to the finger, which of course carried before it a portion of the anterior rectal wall. He then succeeded in getting two fingers through the ring, when it became sufficiently dilated for the fundus to be pushed up on the point of the index finger without further difficulty, and the restoration was completed.

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[1] Thomas on Diseases of Women, page 636.

I was called, as one of the Consulting Board, to see this case with Dr. Watts when she was first admitted to the hospital. She was a young negro woman who had given birth to at least one child, but my impression is that the time of inversion could not be accurately determined by her history. A small fibroid, however, was found at the fundus which may have produced the inversion. This tumor was enucleated, and attempts at reduction were made, which failed. Subsequently another effort was undertaken and persevered in. I assisted Dr. Watts, but we did not accomplish more than to advance the fundus within the cervix. I was unable to assist him at the final effort, but after resorting to the plan described, the reduction was rapidly accomplished.

Emmet's Method.—In 1865 I succeeded in effecting a reduction by passing my hand into the vagina, and, with the fingers and thumb encircling the portion of the body close to the seat of inversion, the fundus was allowed to rest in the palm of the hand. This portion of the body was firmly grasped, pushed upward, and the fingers were then immediately separated to their utmost; at the same time the other hand was employed over the abdomen in the attempt to roll out the parts forming the ring, by sliding the abdominal parietes over its edge. This manœuvre was repeated and continued. At length, as the transverse diameter of the uterine cervix and os was increased by lateral dilatation with the outspread fingers, the long diameter of the body became shortened, and the degree of inversion proportionately lessened. After the body had advanced well within the cervix, steady upward pressure upon the fundus was applied by the tips of all the fingers brought together.

This method will be described more fully in the history of several cases which are to be presented in detail. At the same time there will be given a plan for closing the lips over the fundus after a partial reduction (and this may essentially be included in Emmet's method), for the purpose of preserving for a time the advance already gained, or to prevent a recurrence of a complete inversion when the whole amount cannot be reduced.

CASE XVI.[1]—Mrs. Q., aged 24, came under my charge Oct. 8, 1865. She had menstruated for the first time at eleven years of age, with no return for a year, but after this period she became regular and continued in perfect health. She was married at twenty-two years of age; soon afterwards became pregnant, and went to full term. Labor commenced between the hours of nine and ten P. M. March 11,

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[1] Read before the New York Obstetrical Society, Nov. 21, 1865.

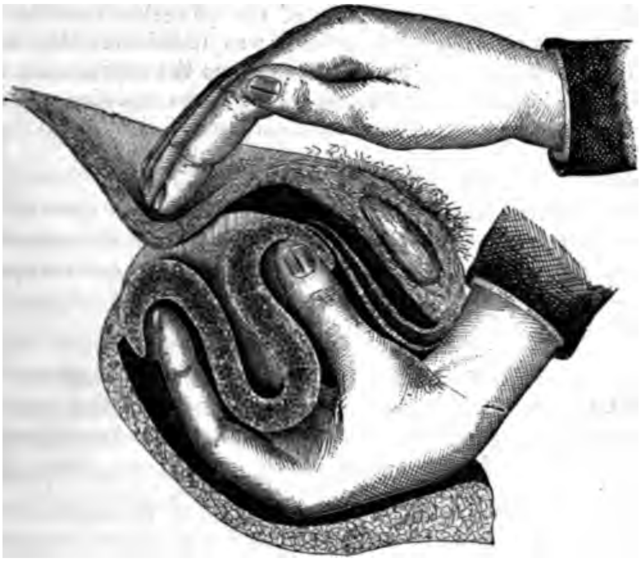
1865. About eleven A. M. the membranes were ruptured, and delivery of a large male child took place an hour afterwards, labor having continued nearly thirteen hours. As the head passed the vulva, it was discovered that the umbilical cord had made several turns around the child's neck. The cord, as stated, was slipped over the head without traction, the body followed immediately, and soon afterwards the placenta. Within an hour after delivery the patient suddenly became faint, with violent after-pains coming on. This condition continued for forty-eight hours with a bloody discharge, which, at the time of each pain, was expelled from the vagina with considerable force. After the pain had ceased, the flow continued more than natural, and at times was almost of pure blood. About a week after delivery the nurse discovered a mass presenting just within the vagina. An examination was made by the attendant, a consultation called, and the case pronounced, as the patient stated, one of cauliflower growth. At the end of a month her general health became so much impaired by a constant sanguineous discharge, that Dr. McCall, of Utica, was consulted, and he recommended her to my care. On making a vaginal examination, a soft mass somewhat larger than an egg was felt lying in the axis of the vagina, and, being pedunculated, might well have been mistaken for a polypus. I passed two fingers of the left hand well up into the cul-de-sac behind the mass, so as to lift the uterus above the pubes, and, with the other hand over the abdomen, I was able to approximate the two sufficiently to satisfy myself that the case was one of inversion. She presented every indication of suffering from extreme anæmia.

Oct. 10. Pulse 160 per minute; at 12.30 P. M. she was placed under the influence of ether. Since it was a serious question if in her reduced condition, the anæsthetic could be continued long enough to effect the reduction, I requested Drs. George T. Elliot, Jr., Sabine, and Thomas to aid me with their counsel. She came fully under the influence of the anæsthetic in a few moments, with the effect of reducing the pulse in frequency, and making it fuller.

The patient had been placed on a table of a convenient height for me to operate while seated, and lay on the back with knees drawn up. The left hand was passed entirely within the vagina, and by pressure of the fingers the fundus "dimpled," while the organ was steadied by the right hand over the abdomen. At the end of an hour I found that little progress had been made, but the fundus had become somewhat smaller from pressure.

There was full time for reflection, when it became evident to me that the mode of reduction by pressure made at the fundus was not so applicable when the uterus had already contracted to nearly its natural size. As the fundus was indented by pressure, the body spread laterally beyond the cervix, and, although it materially dilated the neck by flattening it, the power was lost, without influencing to any extent the point of constriction. In fact, a continued force from the fundus in the upward direction seemed to increase the difficulty by rolling in the parts at the point of inversion. With this view, I allowed the fundus to drop into the palm of my hand, and passing the thumb and finger around the mass as high up as possible within the cervix, as shown by Fig. 77, I continued to enlarge the space between the neck and inverted body, by forcibly expanding the fingers as much as possible. At the same time I made steady upward pressure with a view of returning first the portion last involved. This manœuvre was aided by lifting the organ above the pubes, and endeavoring, with the other hand, to roll out the inverted portion by sliding the abdominal wall over the point with some pressure (see Fig. 77). In the course of half an hour, the progress of the reduction was marked. The globular mass which was felt through the abdominal parietes in the beginning now gradually became oval laterally, with a marked depression in the centre. By this time my hand had become almost powerless, and I was obliged to call on Dr. Elliot to relieve me for a few moments; I then continued the manipulation for some three-quarters of an hour longer, when Dr. Thomas, who had been absent during the previous hour, returned. From his appreciation of the progress made, the only fear I entertained of final success was a failure of the patient's power of endurance. Gradually the fundus passed entirely within the cervix, but beyond this point, for an hour longer, but little advance was made in the reduction. The depression, however, felt through the abdominal walls, above the seat of inversion, had become large enough apparently to admit the extremities of three fingers, and there was a proportionate increase in the size of the mass. During the whole time the patient was kept pro-

Fig. 77.



Author's mode of reducing an inverted uterus.

foundly etherized by Dr. Perry. This was found necessary from the fact that in the beginning, when its influence was lessened to any degree, vomiting came on immediately, and with any movement of the patient it was impossible to steady the uterus or maintain the necessary amount of pressure. The pulse had continued good throughout, and her general appearance was satisfactory. Shortly before four o'clock she began to fail; at ten minutes after that hour her condition had become critical, and I was obliged to abandon my efforts for the time, in consequence of the powerless condition of my hands. In consultation, the opinion was unanimous that it would jeopardize the life of the patient to continue the etherization longer. At my request a last effort was made, for I was satisfied that I could not be deceived in the fact that the depression felt through the abdomen was slowly becoming larger. Drs. Sabine and Elliot, after a few moments, desisted from their efforts, as the latter gentleman had advised a frequent change, so that, the hand of each operator having been rested, the power exerted would be maintained in a more uniform manner. Dr. Thomas, who had been present but a short time since the commencement of the operation, returned just as we were desisting. He passed his hand into the vagina, and, as he describes it, drew down the mass so as to reproduce the inversion, and, on immediately returning it, found that it did so beyond its previous position; he repeated this manœuvre, and on returning it, on the point of his finger (without force on his part, as he stated), the fundus passed on, and the reduction was completed, after an effort of three hours and fifty-five minutes. During at least three hours and a half of this time I was attempting the reduction with either the one or the other of my hands in the vagina.

The patient speedily recovered consciousness. During the vomiting, as a precaution, I passed the index finger directly into the relaxed canal of the uterus which was presenting immediately within the labia. It was fortunate that I did so, for on the instant I felt a portion of the posterior wall, near the fundus, become indented. With the other hand on the abdomen, I seized the organ and restored the portion on the point of my finger, and retained it in the canal until the paroxysm had passed. It was the only effort at vomiting, and there was no return of the inversion.

At 5 P. M., with a pulse of 130, twenty-five drops of Magendie's solution of morphia were administered, with beef-tea, by the mouth. At 9 P. M., pulse 128, as she was suffering from pain generally over the abdomen, thirty drops of Magendie's solution were again given. She was sleeping quietly at 10.30 P. M.; pulse 112 per minute. At midnight the pulse was 108, and she had been sleeping since the last visit.

Oct. 11. At 9 A. M. the pulse was 110; she was free from pain, and had passed a quiet night. As there was some tenderness on pressure over the abdomen, a large poultice was ordered. At noon her condition was comfortable, but the pulse was 120, with some increase of tenderness over the abdomen; ordered the morphine to be repeated. Half-past 2 P. M., she was free from pain and sleeping quietly, with the pulse 105. At 7 o'clock P. M. the pulse was the same: repeated the morphia.

12th, 9 A. M. Pulse 100; she was entirely free from pain, and had passed a very comfortable night. From this time she was kept quiet in bed for twelve days, and no further treatment was necessary. November 28 she visited me, after taking a long drive. I found that the uterus had returned nearly to its normal size. She had menstruated naturally a few days before, and was rapidly regaining her strength and flesh.

This lady has recently died, I learn, from an attack of pneumonia. She lived some twelve years after the operation, and in that time gave birth to five children, all in natural labors.

On presenting this case to the Obstetrical Society, I claimed that the point was one of great interest and worthy of discussion, as to what bearing the manœuvre, as practised by Dr. Thomas, had on the result, and, if effective, to determine the exact circumstances under which it should be resorted to. My own impression was expressed to the effect that Dr. Thomas was mistaken as to the extent of inversion reproduced by him. The portion below the constriction was flaccid, and could be readily drawn down, but above the engaging point, where the surfaces were forced into such close proximity, it was a question whether more force would not have been requisite to reproduce the condition existing at the beginning than it was possible to have exerted. Dr. Thomas's effort, doubtless, hastened the issue, yet as the widest portion of the uterus was already so far advanced within the canal, it was probable that the unaided muscular action of the organ itself might, at this stage, have soon completed the reduction, as, judging from the result, the canal was evidently already dilated sufficiently for the purpose. This was demonstrated on an India-rubber ball which had been indented, and it was shown that as soon as restitution has once commenced it rapidly progresses to its consummation.

The paper was discussed at length by Drs. Elliot, Noeggerath, and Budd, and these gentlemen fully sustained my views. In fact, Dr. Thomas himself, with great candor, stated that he was satisfied he had been mistaken.

CASE XVII.—Dr. Gouley, Feb. 17, 1866, requested Dr. Noeggerath and myself to see a case of inverted uterus under his charge in St. Vincent's Hospital, of this city. With his permission I reported the case,[1] as possessing additional interest, from the fact that the reduction was effected by the method proposed by myself, as described in the preceding case. The patient was about 24 years of age. In the preceding June, at full term, and in perfect health, she was delivered of her second child by a very rapid labor, in which she had but one severe expulsive pain, and that just as the head was expelled. Until a few moments previous to delivery, she had not found it necessary to lie down. The after-pains came on at once, they were severe, and lasted longer than had been the case after the birth of her previous child. From a short time after delivery until the reduction, there had been a constant show, which frequently amounted to hemorrhage, and she presented the appearance of one who had been suffering from an excessive loss of blood. Her condition had been attributed to the existence of a polypus, which was supposed to be protruding from the os uteri, and she had been sent to the hospital to have it removed.

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[1] American Journal of the Medical Sciences, April, 1866.

After she had been gotten under ether, Dr. Gouley, as well as Dr. Wm. H. Van Buren, concurred in the diagnosis formed by Dr. Noeggerath and myself. At my request, Dr. Noeggerath, following Dr. Gouley, attempted the reduction by his method of depressing one side of the fundus into the canal and carrying this portion up first, as has been described. After an attempt of some fifteen minutes, he found it impossible to indent the body sufficiently, and desisted. I passed my hand into the vagina, and for a while endeavored to put his method into practice, but found it impossible to produce any real effect. In fact, the organ was so dense, and contracted to so nearly its natural size, that the case was not a fair one in which to test his mode, nor was the inversion one which could have been reduced by pressure at the fundus, as proposed by Prof. White, while it was in every respect favorable to the method I resorted to. I passed my fingers around the portion within the os as described in the previous case. Then, with a simultaneous upward and outward pressure, the neck was gradually dilated, until, by a forcible extension of the fingers, the seat of inversion was reached. In less than half an hour the mass, as felt through the abdominal parietes, had doubled in size, the depression in the centre had become larger, and the shape had changed from a circle to an oval. The fundus gradually passed entirely within the cervix, but, after this, the progress, as appreciated by the fingers within the uterus, was almost imperceptible, though the rapidly increasing size of the mass and diameter of the depression, at the seat of inversion, was recognized by all present. At the end of an hour, my hand in the vagina became so powerless that, without the aid of the hand over the abdomen, I was unable to feel the body of the uterus within its grasp. I finally requested Dr. Noeggerath to relieve me, and, by his continued manipulation, in about ten minutes the reduction was completed, after a conjoined effort of an hour and twenty minutes.

This woman had a rapid recovery, but I have known nothing of her history subsequent to her leaving the hospital.

Case XVIII.[1]—Mrs. C., aged 26, on the recommendation of Dr. Crispell, of Rondout, N. Y., was admitted to my private hospital, May 21, 1867, and presented the following history. She menstruated first at 12 years of age, married at 23, and had been in perfect health previous to the birth of her child. Labor at full term commenced Dec. 22, 1865, and was terminated without artificial aid at the end of twenty hours, its progress having been somewhat tedious, but otherwise natural. By the next pain following the birth, the placenta was expelled, without traction or any interference. The cord was of a natural length, and not looped about the body of the child. She was attended by a physician of experience, who furnished Dr. Crispell with the following interesting features of the case. Before putting on the bandage he waited some time, and satisfied himself that the uterus had properly contracted. As he was leaving the house he heard her bearing down as with an expulsive pain, but feeling satisfied that there could be nothing unusual in her condition, he proceeded to his home, but a few hundred yards distant. He, however, felt uneasy, and on his almost immediate return he found that he was just being sent for, and that there had been hemorrhage and violent and continuous pain ever since his departure. An examination disclosed a complete inversion of the uterus, which he immediately reduced without difficulty, and, with the recurrence of pain, the organ contracted naturally. He remained in the house for nearly three-quarters of an hour afterwards, and, before leaving, satisfied himself that the uterus had properly contracted. The after-pains were slight, she made a good recovery, nursed her child, and was apparently in perfect health until thirteen months afterwards. Menstruation then returned, and, at the end of five days, when it had nearly ceased, excessive hemorrhage suddenly came on. The uterus was then found completely inverted, and the fundus just within the labia. By astringent injections the hemorrhage was for the time arrested. At the end of the fifth day of the next menstrual period, the hemorrhage again occurred, and with each period afterwards would continue until arrested by astringents or the tampon. She was exceedingly anæmic, and had at all times a profuse watery discharge, with a tendency to hemorrhage on the least exertion.

A few days after her admission, with a pulse of 120, she was placed under ether, and I attempted the reduction. Drs. Peaslee, Crispell, and Perry were present. The condition of the uterus was remarkable, and it might easily have been mistaken for a polypus. The vagina was found occupied by a soft, smooth mass about the size of a hen's egg, with a distinct pedicle scarcely three-quarters of an inch in diameter, around which the cervix was well contracted. The uterine probe passed a little over two inches into the canal, and apparently to the fundus. The left hand was introduced into the vagina, and the other above the pubes, they were then approximated sufficiently behind the uterus to indicate that the case was one of inversion, while from the shape of the mass and the depression in its centre, felt through the abdominal wall, there remained no question as to the true condition. Half an hour after commencing the reduction, by the method described, the cervix and canal had become so dilated that the fundus could be carried entirely within the uterine cavity, but beyond this no progress could be made in the reduction. The pedunculated portion was so small that it would double on itself in such a manner that the upward force, of so much importance at this stage, could not be fully exerted, and was lost to a great extent. Over the edge of the ring, formed by a portion which had been inverted and now but just rolled out, the broad ligament on the right side was felt thickened and dipping into the canal formed by the inversion. On turning the uterus up against the abdominal wall, by means of the hand in the vagina, this condition was recognized by all present, and as the mass could not be moved aside, it was feared that adhesions existed to an extent which could not be overcome. It was also thought that this had given rise to some impediment to the circulation, and thus brought about an atrophied condition of the body of the organ. At the end of three hours the condition of the patient became so feeble that all further attempts at reduction were for the time abandoned.

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[1] The American Journal of the Medical Sciences, Jan. 1868.

June 19. Ether was again administered, the pulse being feeble, and 140 per minute. Drs. Peaslee, Clymer, Crispell, and Perry were present. Notwithstanding that the original condition of the inversion had returned, in less than half an hour all was gained that had been accomplished by the previous effort. At the end of the first hour the pedunculated part of the body had disappeared, and the ring at the seat of the inversion had become so dilated that, by pushing up through it a portion on the right side, the finger was distinctly felt through the abdominal wall by the gentlemen present. It was now evident that the broad ligament, in a mass, was firmly adherent, and that the reduction could not be accomplished unless the ring at the seat of inversion could be dilated sufficiently to admit of the left side of the uterus being reduced first, and afterwards the opposite side by rotating it bodily around through the dilated portion, thus leaving the adhesions intact. But to accomplish this extent of dilatation was almost beyond the expanding capacity of the fingers. I continued, however, my efforts for *five hours*, occasionally being assisted, towards the close, by Drs. Peaslee and Perry, but no progress was made after the first hour, except to dilate gradually the portion below the seat of inversion to such an extent that the cervix and uterine canal became lost almost as one continuous cavity with the vagina. During the last hour the circulation became so irregular and feeble that the anæsthetic had to be abandoned, and stimulants, as well as beef-tea, freely resorted to. At length I was reluctantly forced to cease my efforts for the time, but I was determined to make another attempt, and not wishing to lose what had already been gained, I introduced rapidly five deep interrupted silver sutures into the neck of the uterus, and on twisting them drew the sides of the cervix together over the fundus, thus confining it within the uterine canal, like a ball within its cover.

This was done on Wednesday; she soon rallied, and within twelve hours had regained her usual condition, still full of hope and not discouraged by the failure. She was kept in bed, and on the following Saturday, about noon, she felt something suddenly slip, as she expressed it, with immediate relief from a feeling of fulness which she had experienced since the operation. My impression at once was that the sutures had torn out, or possibly that the uterus had become reduced, but on examination the sutures were found intact, and on passing the sound between them the fundus was felt behind. I now became satisfied that the adhesions above had separated, and that I could almost promise success from the next effort at reduction. In case of failure, however, I determined to freshen the edges of the cervix, reintroduce the sutures, and, by uniting the parts permanently, to confine the fundus within the uterine canal.

On the following Wednesday, a week after the previous attempt, ether was again administered and the sutures removed. The fundus immediately dropped into the vagina, while the extent of dilatation was about the same as had been gained on each previous attempt at the end of the first half hour, but the mass above, supposed to have been the broad ligament, had disappeared. After she had been examined by the gentlemen, in twenty-seven minutes from the time my hand was introduced into the vagina, about five minutes of which time were occupied in ascertaining her condition, I reduced the inverted organ unaided. Drs. Clymer and Perry were present at the time of reduction; Dr. Peaslee was also at the beginning, but was obliged to leave to see a patient, intending to return to aid me afterwards. The effect of the reduction on the circulation was remarkable, for, within half an hour afterwards, the heart's action became regular, and the pulse fell from 150 to 90 beats per minute. Her whole appearance was improved, and her lips, which had been previously bloodless, became of a natural color. Not a bad symptom supervened; she sat up at the end of a week, and returned home early in July.

Mrs. C. soon regained her usual health, but became sterile. I made an examination several years after the reduction, but found no special lesion beyond a partial double laceration of the cervix, which did not allow the parts to roll out sufficiently to necessitate an operation.

An interesting point in this case is to determine at what time after labor the inversion was reproduced. Mrs. C. for a year after her confinement was apparently in perfect health, and led an active life, while neither she nor her husband was aware of a condition which, in a marital relation, would have amounted to a positive obstruction had the inversion existed to the extent found at my first examination. After the fifth day of the first menstrual period, she was never free from backache, nor from a profuse watery discharge, until after the fundus was secured by closing the cervix; she was also liable to hemorrhage on making the slightest exertion. The attending physician satisfied himself, as has been stated, that the uterus contracted properly after he restored the organ, and I have been assured, from his professional standing, that he could scarcely have been deceived on this point. Nor is there any evidence that he may have been mistaken, for the symptoms of inversion are generally unmistakable immediately on the occurrence of the accident. Is it possible that nursing the child could have exerted an influence to the extent of keeping in abeyance, as it were, every symptom of this condition, if it existed, during the year after her delivery? And yet, while the first menstrual period was painful, it was not more so than had been frequently the case before pregnancy, nor was it increased in intensity at any time, from confinement to the first return of the menses, so that no indication is offered of the moment when the inversion probably occurred. From the data presented in the case, I confess myself entirely at a loss to offer even a speculation on the subject.

Case XIX.[1]—Mrs. Conklin, aged 54, was admitted to the Woman's Hospital April 19, 1869, with the following history: Her general health during childhood had been delicate, and at the approach of a retarded puberty she suffered from frequent attacks of fainting, with great nervous prostration. She menstruated for the first time at eighteen, but never became regular. It was her impression that the flow had been from the first unusually painful, too frequent, and profuse. She married at thirty-five, and remained sterile. During her married life the menstrual flow became more painful and irregular, while at times she was not free from a show for more than three or four days in each month. During the same period, until a change of life took place at the age of fifty, she suffered almost constantly from a dragging pain in the back and about the hips. After the menstrual cessation her general health improved and continued to do so for two years. During February, 1867, she contracted a severe cold, and while in the midst of a paroxysm of coughing she suddenly experienced a feeling of great discomfort in the vagina, accompanied by pain in the back and hips, which could not be localized. Her suffering became so urgent that she was obliged to seek relief from her physician. A vaginal examination was not, however, deemed necessary, but from the symptoms her suffering was attributed to "falling of the womb," for which the recumbent position and astringent injections were prescribed. Since she did not obtain relief by these means, she made a digital examination and found the vagina obstructed near the outlet by a mass which was not there a short time previous. She remained an invalid, unable to stand or exercise, with a constant vaginal discharge for fourteen months previous to her admission to the hospital.

On examination, the uterus was found inverted, with a fibro-cystic tumor situated at the fundus, which presented just within the labia. As will be seen by reference to the plate, the uterus was completely inverted on the left, while on the other side the line of the shortened cervix was defined by a shallow crescentic-shaped sulcus. The uterus was an inch and three-quarters in length, from the bottom of this fold to the attachment of the tumor at the fundus. The tumor was as large as a pigeon's egg (see Fig. 78), but had evidently undergone a reduction in size from cystic degeneration. Several large cysts existing within the mass were prominent, while on the surface were several cicatricial depressions, evidently the traces of other cysts which, in being emptied, had brought about a diminution in the size of the tumor. The mucous surface of the uterus was of a pale color, presenting in fact the same appearance as that of the vagina, and did not bleed on being handled. The arborescent configuration of its surface was well marked, and on the right side the shrivelled remains of a mucous polypus existed. The diagnosis, as to the condition of the uterus, was proved by passing the index finger into the rectum, so as to approximate the extremity of a sound felt within the bladder at a point just above the mass in the vagina, it being evident at the same time that nothing existed above the plane of the vaginal junction which could be mistaken for the body of the uterus.

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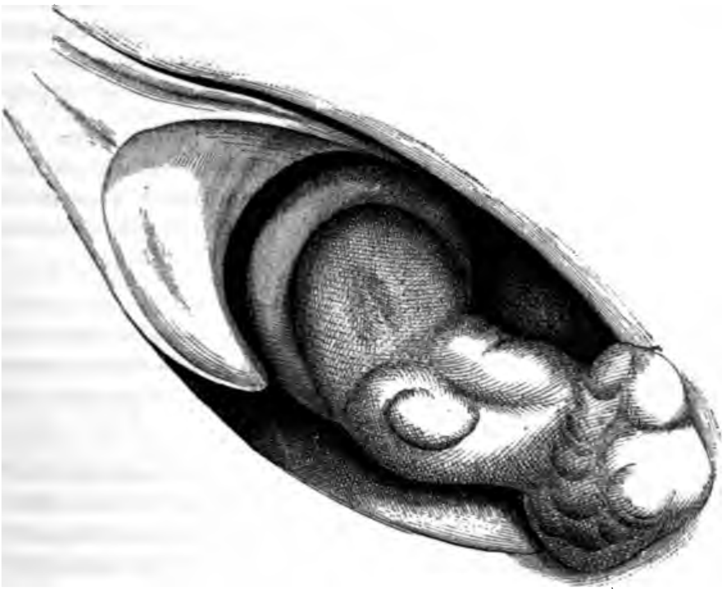
[1] The American Journal of Obstetrics, August, 1869.

Fig. 78.



Inverted uterus, with fibro-cystic tumor. (Speculum in situ.)

May 4. A consultation was called, ether was administered, and the condition verified by Dr. George T. Elliot, one of the Consulting Board, and Drs. G. C. Nott, Trask, Swift, Perry, and others present.

The écraseur was applied, and the tumor removed from the fundus with but little bleeding afterwards. It was then determined to introduce the hand into the vagina, and to reduce the inversion by the method we have been describing for the previous cases. It was found however, impossible to introduce the hand, as the patient was obese and had a short and narrow vagina, the result of a change of life The uterus was therefore drawn down to the vulva, and the organ steadied by seizing the edge of the cervix on each side with a tenaculum held by an assistant. With the uterus thus fixed, a portion in advance of the vaginal junction was grasped between the thumb and forefinger of the right hand, while a steady upward pressure was made until the os uteri became well defined. The cervix was then dilated by passing the index finger around at the bottom of the sulcus, between the neck and inverted body of the uterus, while at the same time a steady upward pressure was maintained by the finger. When the fore-finger became fatigued, the body was seized with the fingers as in the beginning, and the upward pressure exerted, while the index finger of the other hand was passed into the rectum behind the organ to relieve the strain on the tenacula, which were frequently tearing out. After three-quarters of an hour, the fundus passed within the os uteri. After persevering an hour longer, it had advanced above the plane of the vaginal junction, so that a sound could be passed within the cavity a little over an inch. From this time no advance was made, and attributing it to the fact that my fingers had become too cramped for effective service, I obtained Dr. Elliot's aid, but without his being able to make any apparent change. It now became evident that attempt at further reduction would have to be abandoned on account of the condition of the patient, and the certainty of adhesions as suggested by Dr. Nott. This view was strengthened after a careful digital examination per rectum. It was found that the depression which had been felt at the seat of inversion, before attempting the reduction, had nearly disappeared, while in fact it should have been enlarged as the reduction advanced. Although the exact condition could not be defined, Dr. Nott's explanation seemed to be the true one, that some portion of the broad ligament had become adherent on both sides, and when the reduction had advanced so far as to roll out these surfaces to a certain point, no further advance could be made unless a separation could be brought about on one side at least. The patient had been suffering from a catarrh previous to the operation, so that it became necessary to desist in consequence of great irritability of the air passages produced by so long a continuance of the ether.

As in the previous and similar case where adhesions existed, and the procedure had proved successful in striping them off, I introduced three deep interrupted silver sutures into the cervix. On twisting these, the sides of the os, in the middle, were brought together over the fundus. Thus the exercise of a steady force was kept up, well calculated, as we shall see, for gradually overcoming any adhesions which were not of too firm a character. Moreover, the advance already made was thus secured, so that the reduction could be again attempted under more favorable circumstances if deemed advisable. She reacted badly from the effects of the ether, vomiting afterwards, and suffered from a severe attack of bronchitis. On the seventh day the sutures were removed, and, as the general condition of the patient would not admit of further interference, no attempt was made to complete the reduction. The fundus still remained within the canal after the withdrawal of the sutures, but as she was suffering from a constant cough it was fully expected that the inversion would again become complete. On the 21th day after the operation, she returned home to recruit, but before doing so an examination was made, when it was found to my surprise and satisfaction that no descent of the fundus had taken place.

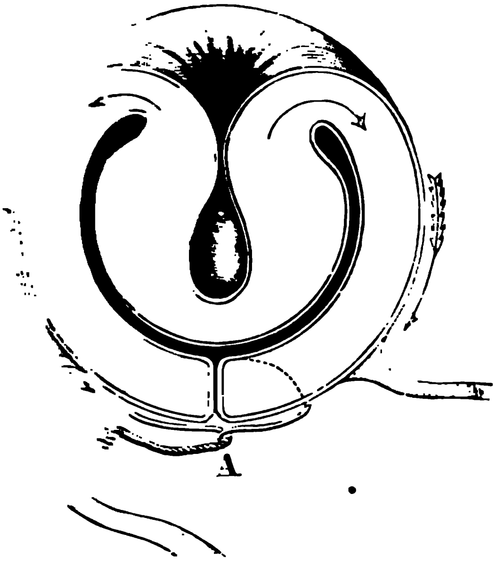
June 15. She returned to the hospital having recovered her health, and was able to walk or stand without the least inconvenience.

18*th*. In the presence of Drs. Nott, Trask, Prof. John S. Davis of the University of Va., and others, I denuded a portion of the inner face of the os uteri, and, after introducing three deep interrupted silver sutures, brought the sides together in the centre, leaving the line open at each extremity. Notwithstanding the fundus had not descended, and the canal remained of the same depth as after the attempt at reduction had been abandoned, it was decided best to partially close the os for fear that by accident the inversion might be again produced. It was not deemed necessary to made a second attempt at the reduction, from the fact that the existence of firm adhesions seemed proved by the fundus remaining in the same position, after the support given by the sutures had been withdrawn. Moreover, her age did not make it so necessary to persevere, and she was unwilling to take ether again, and without this but little could be accomplished. The sutures were removed on the eighth day, the union was found perfect, and shortly afterwards she was discharged from the hospital. Five years after I ascertained through a friend that she was in good health.

A similar case of inversion of the uterus, caused by a tumor at the fundus, is reported by Dr. Alfred H. McClintock in his "Clinical Memoirs on Diseases of Women," page 97. Other cases are on record, but all, with the exception of these, had borne children, so far as my knowledge extends.

I believe that the procedure resorted to in these cases, of confining the fundus within the uterine canal, will prove to be of the greatest practical importance. Where, from any cause, the attempt at reduction has to be abandoned for the time, an extensive amount of dilatation is thus preserved until the condition of the patient will admit of another effort for her relief. On a moment's reflection, it will be evident that a persistent dilating force is at once established, without taxing the strength of the patient, which may of itself, in some cases, [illegible] direction unaided. By stretching the cervix over the [illegible] dilating mass within the uterine canal, a force is exerted [illegible] of the organ to roll out the parts above, while, at the [illegible] upward action is at once established below the inversion, [illegible] the fundus as a wedge in the direction offering the least [illegible] Then, any action of either the longitudinal or circular [illegible] of the uterus, or both together, will aid in the reduction. By [illegible] diagram, Fig. 79, the action of these forces will be seen [illegible] the direction of the arrow-heads.

Fig. 79.



[illegible] traction exerted by sutures in cervix uteri [illegible] reduction of inversion.

[illegible] not succeed in completing the reduction in one of [illegible] was due, I believe, to the singularly peduncu- [illegible] But that the force was exerted to a great [illegible] the fact that the adhesions of the broad ligament [illegible] were separated by its action, although I had [illegible] so much after a continuous effort of four [illegible] but little time and patience to dilate [illegible] canal by the method I have proposed. [illegible] cannot be completed at the time, the fundus [illegible] the same continuous force will be maintained [illegible] patient. The power exerted is exactly that brought to bear on the uterus when the vagina has been fully distended by an air-bag. The fundus is crowded up into the canal, and the vaginal walls being put on the stretch aid, to some extent, in pulling open the parts above at the seat of inversion. But this plan is not effective unless the vagina be distended to the utmost. Then great suffering is necessarily inflicted on the patient, and there is risk always of exciting cellulitis and even peritonitis.

But the point I wish particularly to establish is the advantage of closing the os in cases where the inversion is irreducible, a condition, however, I am not willing to acknowledge is possible, except under some very unusual circumstances. In view of this, I think it is wholly unjustifiable to amputate the inverted portion of the uterus if the fundus can be gotten within the cervix.

For this part of the operation it is necessary to denude with a pair of scissors the inner edge of the cervix, and to secure its surfaces by a number of interrupted silver sutures. Or the whipstitch may be employed, to be introduced far back from the edge and near the vaginal junction, so as to render it impossible for it to cut out before perfect union has been obtained. In Fig. 79, which represents a section of the left half of the uterus, the dotted lines show the course of a suture already twisted, but not yet bent over flat to the vaginal surface. It is not advisable that the denudation should be extended entirely around the cervical canal, but only so far as will insure an opening at each angle of the line for the free escape of the secretions and menstrual flow. By this operation, all hemorrhage due to the inversion will be arrested at once. The patient will soon recover her strength, and may even become pregnant, and should this occur, nature may be relied upon to complete the reduction. The line of union would offer certainly but little obstruction to the progress of labor, for if separation did not take place at the proper time, a pair of scissors could be readily made to snip it open.

But I would advise, before resorting to denudation for bringing about permanent closure of the os, that the suture alone be employed. This would give the opportunity for making another attempt at reduction if nature failed to accomplish it. To test this fairly the sutures should be allowed to remain undisturbed for weeks if they do not cut from too great tension. Their ends should be bent over properly, and made to lie flat to the surface, according to the directions which have been already given.

That this plan of reduction has not fully succeeded in the hands of others is due either to the fact that the different steps have not been understood, or that the attempt has been made to accomplish too much in too short a time. Let us briefly review the different steps and the principle involved in the operation. By a glance at Fig. 77, it will be apparent that the surfaces within the neck cannot be separated to any extent without rolling out the parts immediately at the seat of inversion. This action must necessarily, at the same time, pull open the mouth of the canal now formed by the external surface of the uterus. Through this dilated canal the inverted portion of the organ is to be returned. Until the fundus has passed well within the cervix, the chief effort must be directed to dilating the neck by expanding the fingers in an upward and outward direction. In other words, the uterus should be firmly grasped by all the fingers immediately below the seat of inversion, and, at the instant before expanding the fingers, be pressed upwards against the hand on the abdominal wall. The hand above should at the same moment be making pressure downward and outward, by sliding the parietes over the portion within the cavity. The procedure must be repeated in this order until the fundus can be passed entirely within the cervix. The necessity for augmenting this upward pressure increases in proportion to the advance made in the reduction, while the aid derived from expanding the fingers becomes proportionately lessened to the point of completion. There is still, however, a dilating force exerted by wedging the fingers between the prolapsed portion and the sides of the canal. For, as the uterine canal is enlarged in its lateral diameter, the reduction is advanced pari passu by shortening the vertical one. But no advance can be gained by main force, for it is impossible, without rupture, for any portion to pass until the necessary dilatation has been effected. It is well occasionally to alternate the pressure so that it shall bear first to one side and then to the other, instead of pressing the mass always in the same direction. Sometimes it should be a hand-to-hand motion, as in the delivery of the fœtal head by forceps. On the same principle the vagina, for a moment or two at a time, should be placed on the stretch by making steady pressure in the direction of the promontory of the sacrum. By thus changing the direction of pressure in the last stage, a portion of the mass will sometimes suddenly slip up, when a moment before it seemed immovable, from being wedged in such close apposition. By resting the back of the hand in the hollow of the sacrum, so as to turn the organ up against the abdominal wall above the pubes, the hand of the operator is placed in a less constrained position, while at the same time the uterus is steadied, and the counter-pressure exerted by the other hand is maintained to the best advantage. Every step is to be gained by a steady and persistent effort, but without violence. Towards the close of the operation the advance of the fundus is hastened beyond question by a rapid change of assistants, so that the force may be as nearly continuous as possible, and not allowed to flag from the fatigue which must attend the prolonged efforts of any one person. We may repeat, then, that too much must not be attempted at first, for until the vagina has become somewhat dilated, and the hand of the operator accustomed to the manipulation, what was accomplished in the beginning will be to a great extent lost, in consequence of his hand becoming almost powerless from cramp. The operator must learn to husband his strength until the fundus can be passed within the cervix, when it can be made available to the greatest advantage. Finally, so long as the etherization is well borne by the patient, no case must be despaired of in consequence of the apparent want of progress, for at any instant the reduction may be suddenly completed.

I have been credited by Dr. Thomas, in his valuable work on the Diseases of Women, with reviving in the above procedure Viardel's method of reduction. This I am not entitled to, nor does it appear that Viardel had a method. In the first edition of this work, we find the following as the best method of reducing an inverted uterus: "1st. The method of Viardel—dilating by the fingers the constricted neck, and forcing up first the tissue which came forth last." In the second edition—"The first of these methods has long been recognized and practised in France, and has, by authors in that country, been accredited to Viardel. Capuron (Mal. des Femmes, second edition, p. 510) describes it, and Aron and others give it special mention. For chronic cases it is one of the best methods at our command. Dr. Emmet has drawn special attention to it of late, and illustrated its applicability by several cases." In the later editions of the work my connection with the method is no longer mentioned.

Since the merits of the method are thus extolled by so high an authority, I hope I may be pardoned for attempting to gain the credit, certainly due me, of originality in its conception. Dr. Thomas is mistaken in supposing that the above plan of treatment, as described by him, was a familiar one to Viardel. He has obviously been misled in consequence of the expression used by me of "returning first the part which came down last." This principle I do not claim, nor could any one claim it, since precisely the same principle and method are involved in the reduction of hernia by taxis. This principle is as old as the practice of surgery.

In the report of my first case I gave the reason which first led me to treat it on the principle of a hernia, and simply stated the first step, as I might mention the introduction of the index finger into the vagina for an examination, and for which certainly I could claim no originality. While I treated the case as a hernia is treated, my further object was to shorten the long axis of the uterus, and this was done by increasing the lateral diameter; that is, I dilated the ring about the seat of the inversion by spreading out my fingers. The case was one of chronic inversion, the condition for which the method is the best, if not solely applicable.

So far as I have had the means of investigating the matter, all the writers quoted by Dr. Thomas on this subject have reference, without exception, to the treatment of inversion of the uterus as it occurs immediately after labor. Not one had any personal knowledge of the reduction of a chronic inversion, although several cases are mentioned where it had been successful, and all refer to the same one or two instances, which are thus simply given without being vouched for. This fact Dr. Thomas thus states, on page 434 of his book on Diseases of Women: "up to the year 1858, the reposition of inverted uteri may be said to have been limited to replacement within short periods after parturition. It is true that occasional cases had occurred in which chronic inversion had been overcome by taxis and pressure, but these held the position of accidental and anomalous feats in treatment, not that of systematic procedures, which it was incumbent upon the practitioner to essay in every case."

In the first edition of Viardel's work, published towards the close of the seventeenth century, no mention is made of inversion of the uterus. In the last edition,[1] published, I should judge, long after his death, is given, in all probability, his whole experience. In this only a single case of inversion is mentioned, one in which he had delivered a woman of twins; the inversion occurring immediately after the birth, he returned it without delay. A chapter is given "De la précipitation ou chûte de la matrice après l'accouchment, etc., et de la manière de la réduire," which treats of procidentia and inversion. This chapter is accompanied (op. cit., p. 200) by a plate to illustrate the text, the uterus being represented outside of the body, with the placenta attached. The mode of reduction is then shown in another figure, with a boxwood "repoussoir," in the shape of a drumstick, "for the womb, to be used when the hand is too large, and the neck too narrow."

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[1] Observations sur la pratique des accouchemens, etc., par M. Cosme Viardel, chirurgien à Paris, MDCCXLVIII.

After describing the mode of returning a procidentia, the following is literally all that he gives in relation to inversion of the uterus: "2d method, but if it be the result of labor, it should be remedied after the manner I followed in the case of the woman who had twins, namely, put a cloth over the whole surface of the womb, and *joining the five fingers together in the form of a pessary, it should be pushed up into its natural* place, making the patient breathe out, and having previously put her in a proper position, namely, the buttocks slightly elevated, so that the womb can the more readily be replaced, leaving her in this position for a while, without, however, constraining her, and letting her extend her legs only, and hindering her, as far as possible, from talking too much, from blowing her nose, and from making other concussive movements, inasmuch as the diaphragm being pressed downward would compress all the contents of the pelvis, and in this way a second falling might take place. To prevent such an accident, it is necessary to introduce gently a roll of cloth, which should be placed as far back as possible, even to the internal orifice of the womb, not only to hinder a refalling, but to receive the lochia, leaving a part outside so that it may be withdrawn when necessary." From the above there can be no doubt that Viardel referred to a recent case of inversion, and that the uterus was reduced in no other manner than by simply pushing the fundus up into place.

On page 510 of Capuron's work[1] is the following as referred to by Dr. Thomas: "Then, *the fingers being gathered together in the shape of a cone, they are applied to the centre of the tumor to push it in* until the fist occupies the hollow of the uterine cavity. But, if the orifice be not sufficiently dilated to allow the inverted portion to return readily, it is better to grasp the tumor with fingers distributed about the pedicle, and to begin by returning that portion which came down last, as in the case of a hernia." Viardel's name is not mentioned, and certainly the method as described by Capuron is not claimed by me.

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[1] Traité des maladies des femmes, par J. Capuron, seconde édition, à Paris, 1817.

Courty, as the latest French authority, gives on page 800 of his work,[1] the following: "But, when the attempts at reduction are made on a less recent and shrivelled tumor, of which the two peritoneal surfaces almost touch, it is hardly possible to begin the reduction by depression of the fundus. It becomes then necessary to act in another manner, which seems to me also more rational and applicable to a larger number of cases. It consists in grasping the tumor with the whole hand, in compressing it, if it be swollen, to squeeze out the blood to soften and relax it, finally in pressing the borders by means of the extremities of the fingers distributed about the pedicle, and pushing back that portion of the uterus which forms a gutter, which is continuous with the vaginal portion of the neck, to begin by reducing at the first that part nearest to the orifice, in other words, the last inverted, proceeding in that respect, the same as in returning a hernia."

The above is the only description which could be construed into having anything in common with my method. And yet, the meaning is evident—not to dilate laterally with any purpose, but simply to pass the finger up close to the seat of inversion; to treat the case as a hernia. Certainly Viardel is not mentioned in connection with it, nor does Courty give it as the method for chronic inversion, but recommends that which has already been described as his method.

In the praiseworthy desire to be just, we are frequently unjust in settling a question of priority. In my own case I have been unable to find anywhere evidence that the method put in practice by me had ever been employed before. Yet, were it different, I may still claim the credit that is due to every one who, ignorant of the previous history, devises that which had been forgotten and makes it again useful.

The number of cases must be exceedingly small where it would prove impossible to restore an inverted uterus by some one of the different methods which have been detailed. But granting this possibility, I hold that the number is still smaller where, with proper manipulation, the fundus cannot be gotten within the cervix, so that it may be retained there permanently if necessary.

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[1] Traité des maladies de l'utérus etc., Paris, 1866.

The advantages of this latter operation have been already presented, and it has been shown that sometimes it is of itself sufficient to effect the reduction. But granting that nothing more can be accomplished than a partial reduction with the retention of the fundus, this condition is certainly preferable to the danger attending extirpation of the uterus. From the experience gained in the two cases under observation, it is evident that this partial restoration is sufficient to arrest the hemorrhage. It is also shown that the position will restore the circulation in the uterus sufficiently to check the excessive secretion, so that a restoration to health may take place afterwards. By leaving an opening at the time of the operation, menstruation will continue unobstructed, and if, by chance, pregnancy should occur, complete restoration would no doubt be brought about.

Dr. Henry Miller, of Louisville, Ky., has advocated[1] amputation of the uterus in preference not only to gastrotomy for the reduction, as practised by Dr. Thomas, but even to the attempt by taxis. He seems to claim that both the appearance and health of a woman are improved by removal of the uterus. He shows that not only is this so after the loss of the inverted portion, but of the whole organ, and cites a case where the uterus, ovaries, and ligaments were all dragged out by a midwife, with the effect that the physical condition of the woman seemed all the better after her recovery. Most fortunate for her if it was so, but the ends to be gained would hardly justify a resort to the means. Had nature but realized the advantages claimed by the doctor, the uterus would have formed no part of woman's economy at the creation.

Dr. Miller's criticism of the operation I performed in Mrs. Conklin's case (see Case XIX.), by shutting up the fundus within the cervix, was that I "displayed the qualifications of the ingenious and skilful operator more than those of the profound pathologist." He asks the question—"Why should a uterus rioting in disease be stored away in a receptacle specially provided for it? Filled with the germs of disease, as it seemed to be, is there not reason to fear that these will multiply, as in a hotbed, and bring forth fruit unto death? Time alone can give a satisfactory answer to these questions." There was, as he states, extensive disease of the utricular glands; these had undergone cystic degeneration, a common condition attending a change of life.

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[1] Thoughts on Chronic Inversion of the Uterus, etc., Richmond and Louisville Medical Journal, April, 1870.

The formation of these cysts had resulted in the destruction of the glands, they were emptied in the attempt at reduction of the uterus, and could not refill, but the cavity would contract and disappear afterwards. But these questions cannot be better answered, nor the advantage of the operation better attested, than by the fact of her restoration to health and its continuance for years after.

It is possible that a failure may occur to secure a partial reduction, as was the case with Dr. Thomas after fourteen attempts at taxis had been made by himself and others. When the fundus cannot be secured within the cervix, the choice will present itself between amputation of the inverted portion, opening the abdominal wall and attempting the reduction from above, or of abandoning the case. Were the risk of life to the patient no greater than that from ovariotomy at the present day, I should favor as a last resort the procedure followed by Dr. Thomas. But the danger is greater, since the peritoneum after long pressure from an ovarian tumor would be in a very different condition and less liable to inflammation. Yet it is possible that, by the aid of Lister's method, the risk of life may be lessened. But with our present knowledge I would not advocate the operation unless under such circumstances that the life of the patient was in jeopardy, and the choice rested between it and amputation.

Notwithstanding I have known three cases of amputation of the uterus in the practice of others to recover, yet I would not resort to the operation under any circumstances. Dr. West[1] cites twelve deaths in fifty cases, or rather forty-eight, since in two the operation was abandoned. In a report from a German source, in the American Journal of Obstetrics for August, 1868, eighteen deaths are stated as occurring among fifty-eight amputations of inverted uteri. In one hundred and six cases of amputation by ligature and otherwise, over thirty-one per cent. of deaths occurred. Schroeder[2] gives us the following: "adding some more recent cases to the statistics of Scanzoni, we have the following results:"—

	Total.	Recovering.	Death.
Simple removal	14	6 (43 per cent.)	8 (57 per cent.)
Simple ligature	26	19 (73 per cent.)	7 (27 per cent.)
Ligature and removal . . .	29	24 (83 per cent.)	5 (17 per cent.)

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[1] Lectures on the Diseases of Women, London edition, p. 240.

[2] Ziemssen's Cyclopædia, vol. x., American edition, p. 221.

Dr. Thomas saved one case and the other died, yet we can make no true estimate of the actual risk from so small a number. But if the mortality from amputation should prove even no greater than that given above, the risk of life is too great. Then, apart from the danger of amputation, there is the additional disadvantage that, if she escape with her life, the woman is left mutilated to contend with the consequences of imperfect menstruation.

Under ordinary circumstances, by the use of astringent vaginal injections, and by rest at the time of the flow, the tendency to hemorrhage can be kept in check with almost a certainty of its cessation after a change of life. In contrast to this might be mentioned the remarkable degree of immunity from danger attending the most prolonged attempts at reduction by taxis and other means. I have met with but two instances on record where death resulted, and these would, doubtless, have been less likely to occur at the present day with our enlarged experience.

One point seems to be fully established, viz., that amputation by the ligature alone should never be attempted, since the danger of peritonitis and blood-poisoning is greater than by any other method. The best results have been obtained by the temporary use of a wire ligature, which is to be gradually tightened by twisting. After a few days, before sloughing begins, the body may be removed by the écraseur, scissors, or the wire cautery, but at a sufficient distance from the ligature to leave a good stump in case of bleeding. The wire ligature may then be carefully loosened, and removed if there should be no bleeding. Another plan is to remove the greater portion of the mass by means of scissors, and then continue to tighten the wire for a few days, by twisting until it cuts through. In this case it is essential to guard against blood-poisoning, by applying strong carbolic acid to the stump at the time of removal. It is necessary to tighten the wire loop gradually, since much pain and constitutional disturbance are likely to result. This is explained by Dr. Barnes to be due to compression of the Fallopian tubes, both of which are dragged into the new canal formed by the inversion. The object of using the ligature for several days before removing the mass, is to bring about, if possible, adhesion between the peritoneal surface lining the canal, and thus to close the opening which would otherwise exist into the peritoneal cavity. Another object, and a most important one, is to cause a clot to form and plug the two large vessels running along the upper border of the broad ligaments, from which there is always great danger of fatal hemorrhage. It is al necessary for the comfort of the patient, to keep her fully unde influence of opium until the stump separates, and to guard ag blood-poisoning by the frequent use of vaginal injections of water, to which has been added brewer's yeast, or a little ca acid.

CHAPTER XXII.

SUB-INVOLUTION OF THE UTERUS.

THIS condition, together with its causes, has been considered at some length under the head of general principles. It was there treated of as a consequence of faulty nutrition, where from some cause the removal of the old material, consequent upon the pregnancy, had been arrested.

While admitting that frequently this process is stopped or retarded alone through faulty nutrition, we were yet inclined to believe that in a far greater proportion of cases both the sub-involution and faulty nutrition were the effect of a common cause. It is believed that future observation will establish the fact that, as a rule, the involution is first stayed, and then faulty nutrition occurs as a consequence of some injury received during the progress of labor. To the occurrence of laceration of the cervix, and to the formation of cicatricial tissue in the vagina, and to the displacements of the uterus, by all of which the circulation would be obstructed, we must, in most cases, attribute the continuance of an undue size of the uterus long after a reasonable time has elapsed since the delivery. Since each of these conditions is specially treated of under its appropriate head, their further consideration is not called for in connection with sub-involution.

Wherever we find an instance of this enlargement of the uterus remaining after childbirth, and without any apparent cause, as the reception of an injury, we must examine with the greatest care into the state of the general system. When this is at fault we will find a want of tone in the pelvic venous circulation. Our remedies are to be particularly selected with the view of improving the general tone, or, in other words, nutrition. This is to be accomplished by more nutritious food, a change of air when possible, or, if obliged to remain at home, the patient should be constantly in the open air and in the sunlight. In this condition, as in others where the digestion is feeble, we must determine what quantity of food or of any remedy can be readily taken up by the stomach without causing disturbance. It is, therefore, a question, not as to the quantity

CHAPTER XXIII.

LACERATION OF THE CERVIX UTERI.

History—Etiology—Tables XXX. to XXXVII. inclusive, being analyses of lacerations—Influence on menstruation.

During the autumn of 1862, I accidentally recognized the importance of this lesion, and at once instituted a surgical procedure for its relief. The operation then devised has stood the only true test, that of time, and has been but little modified. From the above date, I have continued to operate frequently in both public and private practice.

Feb. 8, 1869, I described the operation fully in a paper[1] read before the Medical Society of the County of New York. Before the same Society, on Sept. 28, 1874, I presented an article[2] on "Lacerations of the Cervix Uteri as a frequent and unrecognized cause of disease." This last paper was soon after translated by Dr. M. Vogel, and published in Berlin, June, 1875. Prof. Breisky, in the following year, published a favorable criticism[3] on the paper translated by Dr. Vogel, together with the report of fourteen cases successfully treated by him.

After finding that some of the views presented in my previous paper had not been fully understood by the profession, I read another article on "The Proper Treatment for Lacerations of the Cervix," before the County Medical Society, early in December, 1876, which was afterwards published.[4] This last article, with the previous one, was soon after published by Dr. Vogel,[5] together with a preface by Dr. Breisky.

I quote from Prof. Breisky's paper upon Cicatricial Ectropium.

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[1] "Surgery of the Cervix," American Journal of Obstetrics, Feb. 1869.

[2] American Journal of Obstetrics, Nov. 1874.

[3] Zur Würdigung des Narbenektropiums des Muttermundes, und dessen Operatives Behandlung nach Emmet, von Prof. Breisky in Prag. Wiener Med. Wochenschrift, No. 49, bis 51, 1876.

[4] American Practitioner, Indianapolis, Ind., Jan. 1877.

[5] "Risse des cervix uteri als eine häufige und nicht erkannte Krankheitsursache und die Behandlung des Risse des cervix uteri. Zwei Schriften von Dr. Thos. Addis Emmet," etc. Uebersetzt von Dr. M. Vogel, mit einem Vorwort von Prof. Breisky in Prag. Berlin, 1878.

"German gynæcological literature took no notice, to my knowledge, before the appearance of the translation by Dr. M. Vogel, published last year as a brochure, of a very remarkable paper read by Dr. T. A. Emmet before the Medical Society of the County of New York, upon Lacerations of the Cervix Uteri," etc. "He describes the cicatricial ectropium of the os uteri known to us through Roser (*Archiv für Heilkunde*, II Jahrgang Heft, Leipzig, O. Wigand, 7 6, No. 298), and for the first time established its pathological significance as well as its treatment. That to Emmet, in fact, belongs this essential share in the question, follows indubitably from a consideration of Roser's treatise. While Roser, in describing his two forms of ectropium, one of which originates through cicatricial distortion, the other by the crowding forward and swelling of the mucous membrane, chiefly concerned himself with the latter form, and with the correction of Lisfranc's interpretation of this condition as "granulation" of the mouth of the womb, he devotes only a few words to the cicatricial ectropium, which he does not regard as frequent. Roser indicates as its cause excessive fissures, also probably obstetrical incisions and gangrenous destruction of the mouth of the womb." "Roser discusses the inflammatory ectropium described by him in detail, also with regard to its therapeutics, in a searching manner, and observes, among other things, '*Many cases of obstinate and inveterate hypertrophy of the lowest part of the uterine mucous membrane may be considered as incurable*, since retrograde metamorphosis, shrinking, and atrophy do not take place, and an entire excision of this part, from the slight significance of the lesion (in many cases to be regarded as almost nothing) is not to be recommended.' Roser manifestly did not give any higher significance to the cicatricial ectropium, for he says '*in the cicatricial ectropium of the uterine mucous membrane, one will scarcely be prompted to undertake a curative experiment.*' This is all that was known upon the subject before Emmet's treatise." "Accordingly, we undoubtedly owe to Roser the first anatomical and etiological exposition of cicatricial ectropium; to Emmet, however, on the other hand, remains the priority of having appreciated and taught a knowledge of the clinical significance and the successful surgical treatment of this affection."

From Roser's description it seems evident that he only referred to the condition where a fissure is left after a laceration of the cervix. This result every one would easily recognize, but until recently no one attached any more importance to the lesion than he did. But by far the most frequent, as well as the most important condition, and the one easiest relieved, he certainly did not appreciate. After the parts have been torn and while they are soft enough to be flattened out by pressure on the floor of the pelvis, there remains no evidence of the laceration, and the true condition frequently cannot be detected by either the sight or by the sense of touch. Roser had not even an appreciation of the causes at work in producing the condition he has described. This is evident from his use of the term "cicatricial ectropium," since the formation of cicatricial tissue is only an incident. Prof. Breisky, in his preface to Dr. Vogel's translation, quotes from my letter to him: "I must take exception to the term 'cicatricial ectropium' as not being the true pathology. There can be no cicatricial tissue formed except on the surfaces lacerated, and if this tissue contracts, it would have the effect of rolling in the parts instead of what does occur. When the condition is produced on the lower eyelid, the mucous membrane is not exposed from cicatricial tissue on this surface, but from the cicatricial tissue on the skin outside causing the traction. The flaps in the cervix are first rolled out, or forced apart from the large uterus resting on the floor of the pelvis, and this is increased as the circulation becomes obstructed, and as the mucous follicles undergo cystic degeneration. The condition at length becomes one of partial strangulation, as in paraphimosis. When nature attempts to fill up the angle by cicatricial tissue, the parts are prevented from rolling out, and we then have the fissure left."

Etiology of Lacerations of the Cervix Uteri.—Previous to collecting the statistical material for this work, I had recognized and treated two hundred and nineteen cases of lacerations of the cervix in my private hospital. This shows that a little over sixteen per cent. of all women who had passed under my observation, and had been impregnated, were found to have had laceration of the cervix. This proportion will seem to many a large one, and yet, as the record extends over thirteen years, doubtless, many cases during that period were not recognized. It was fully six years after my first operation before I had gained experience enough to detect this lesion under its varied forms, while the treatment itself was not perfected until several years later.

To arrive at more definite results as to the frequency of this injury, I have taken from my case books the records of the last five hundred fruitful women coming under my care in private practice. The result is reached that 32.80 per cent. of all women under observation, who had been impregnated, and had suffered from some form of uterine disease, were found to have laceration of the cervix. It is, of

TABLE XXXIII.—*Seat of Lacerations of the Cervix Uteri.*

	Average ages at			Total number for each lesion.	Percentage for each lesion.	Character of the labor when injured, and mode of delivery.									Since last pregnancy, in years.
	Puberty.	Marriage.	First consultation.			Natural.	Rapid.	Tedious.	Forceps.	Turning.	Craniotomy.	Large children.	Miscarriages.	Criminal abortion	
To the left side	14.00	21.26	31.98	67	40.85	2	21	23	10	4	....	6	....	1	4.80
To the right side	13.78	21.52	33.60	23	14.02	2	5	5	4	....	....	5	1	1	5.30
Through both sides. . . .	14.00	21.04	34.62	50	30.48	9	7	17	6	4	....	2	....	5	5.91
Backward	15.00	22.25	42.50	4	2.38	2	1	1	....	....	....	....	....	....	10.50
Circular	13.81	21.60	30.81	11	6.09	2	3	4	....	....	1	....	....	1	4.21
Not stated.	14.44	21.44	33.33	9	5.48	4	1	....	....	1	....	....	1	2	2.97
Total number . . .	....	....	....	164	....	21	38	50	20	9	1	13	2	10	
Average or percentage	14.00	21.47	33.32	....	....	12.74	22.56	30.48	12.19	5.18	.60	7.92	1.21	6.09	5.21

course, possible that this increase in the percentage is due in a measure, but not wholly, to the fact that cases were sent to me by general practitioners; but in few instances had there been a diagnosis made.

The average age at puberty for women who had lacerations was, as will be seen by Table XXXIII., 14 years, and at marriage 21.47 years. These averages approximate so closely to those of all women under observation, that it is evident neither the time of puberty nor of marriage had any bearing on the cause of the lesion. These women first came under my observation at about the average age of thirty-three years and four months, the greatest deviation being for those who had suffered from backward laceration. While the number of cases is too small to give any importance to the circumstance, it is not entirely an accidental one, since it is a form of laceration which would produce the least disturbance, and then only later in life as the vagina becomes changed in shape. In one of the columns of the table will be found the number of the different forms of laceration, and their relative frequency. It will be seen that the injury on the left side is the most common, and double laceration the next. To establish with some degree of accuracy the character of the labor most likely to result in laceration of the cervix, would be an important advance. I endeavored with great care to ascertain from each of these women the prominent features of the labor in which it was supposed the accident occurred. Notwithstanding I had so intelligent a class to deal with, I feel that the information gained is to be accepted only as approximating to the truth. The testimony of a patient as to her labors, and particularly the first one, to be of value, must be confirmed by careful observation on the part of the attending physician. From *à priori* inference I had been prepared to learn that rapid labor was the most common cause of laceration of the cervix. The contrary, however, has proved to be the case, as more than thirty per cent. of the lacerations were attributed to tedious labor. This proportion would be greatly increased by the addition of the forceps cases, which properly should be placed under the head of tedious labor, since, we may assume, forceps were only employed for delivery after the labor had been prolonged. It will be noted that two instances of laceration occurred from miscarriage, and ten as a consequence of criminal abortion. Since my attention has been directed to this subject, I have found the cervix lacerated in every instance where the patient admitted the fact of exposure to malpractice. And my suspicions have been verified several times by the patient acknowledging the charge which I felt justified in making whenever I detected a laceration produced by discharge of the uterine contents before full term. It can readily be understood that laceration of the cervix would occur under these circumstances as well as in rapid labor where the parts are so quickly dilated; but as the result of a tedious labor, it is not so clear, since sloughing would then be a more likely consequence. If the delay was in the first stage of labor, with the os tardy in dilating, a condition of the soft parts might be established which would readily admit of the occurrence of this accident. But, as a rule, the effect of a tedious labor would scarcely be asserted until long after full dilatation of the cervix had been accomplished. I cannot divest myself of the conviction that rapid labor will be found, on further observation, to be a far more important factor in causing this lesion than has been indicated by this record. The proportion of rapid labors, as given, is much more likely to be correct than the contrary. For it is a very natural error for a woman to exaggerate the time, and to regard a labor as tedious, although it may have been a natural one in every respect.

Observation must determine what part meddlesome midwifery plays in producing this accident. The practice of rubbing the finger around the os to excite contraction, and of stripping back the cervix from the head, with the view of facilitating the progress of labor, may be pernicious; but the consequences of any such interference must be very limited, since the history of many well-marked cases shows that labor was terminated before the arrival of the physician.

This lesion is found as frequently among the well-to-do, who have every advantage of competent medical attendance, as among the poor. Of those from whom the material we have been considering was obtained, all were treated in my private practice. They were from all parts of the United States, and were, without exception, able to command the best professional skill in their neighborhood. I have employed every means at my command to settle this point, and my conclusion is to the effect that in no one station of life is the woman more liable to this accident than in another, provided the cases of instrumental delivery are excluded. When laceration does occur from delivery by forceps, among the poorer classes, it is almost always double, and I have seen, at the Woman's Hospital, an extent of injury never met with in private practice. Upon consulting the records of the physicians attending these cases, it is evident that there are some who, with a view to saving time, are in the habit on their arrival of delivering by forceps, without apparently the slightest reference to the stage of labor. There can be no doubt of the fact that among the poor, in this city at least, the forceps are employed to a greater extent than would be permitted among the wealthier classes. As the more frequent victims of this mode of practice, lacerations of the cervix should be more commonly met with among the poor of the large cities, but the proportion is not greater than for those from the smaller towns or country.

We will now complete the consideration of Table XXXIII. by reference to the last column, in which is recorded the average duration, or the interval, since the last pregnancy. The average length of time in all forms of laceration was found to be rather more than five years. The relative duration of this interval, with respect to any one special form of laceration, is not sufficiently marked for comment, with the single exception of the backward lacerations. In this form the state of quasi sterility had existed for twice the length of time given for any other form of the injury. The proportion of these cases, as we have already noted, is smaller than any other, but the sterility was naturally produced by the greater or less degree of retroversion, which existed as a result of the laceration extending into the posterior cul-de-sac, and causing contraction of the parts or tissues located posteriorly.

Table XXXIV. exhibits the number of impregnations taking place previous to the reception of the injury. One hundred and thirty-eight women bore 407 children, and never miscarried. Eighteen had 79 children, and 34 miscarriages. Five had miscarriages alone, and three had criminal abortions produced, which caused laceration of the cervix. One hundred and sixty-four women were impregnated 528 times before the occurrence of laceration, which gives an average of 3.21 impregnations for each woman. The next division of the table is formed from the statement of the patients as to the number of impregnations *they supposed* had taken place *after* the occurrence of the injury. This is only valuable in showing that 71.34 per cent. at least remained sterile, while there is no proof that a single case became impregnated after the occurrence of the laceration. The last portion of the table gives the total number of impregnations, and shows that 164 women were delivered of 514 children, and had 84 miscarriages; and 5 women had been subjected to 10 criminal abortions. This would furnish an average of 3.18 children for each woman, which is almost identically the same as the average number of children borne by all the women under observation. If the number of children and miscarriages, that is, if the whole number of impregnations be taken, the average would be 3.70 for each woman, a

TABLE XXXV.—*Showing Seat of Laceration in 219 Women, and subsequent changes in Menstruation.*

Lacerations of the Cervix.	PERIOD REMAINED UNCHANGED AS TO TIME AND QUANTITY, BEING FROM THE BEGINNING EITHER						PERIOD REMAINED UNCHANGED AS TO TIME, BUT THE QUANTITY BECAME AFTERWARDS EITHER						SUMMARY. Menstruat'n unchanged in duration from the beginning.		LENGTH OF PERIOD BECAME INCREASED, WITH THE QUANTITY EITHER						LENGTH OF PERIOD BECAME LESSENED, WITH THE QUANTITY EITHER						SUMMARY. Where menstruation became chang'd both in time and quantity.		Total on all conditions.	
	Normal		Too free		Scanty.		Increased.		Lessened.		Irregular.		Total.		Increased.		Lessened.		Irregular.		Lessened.		Increased.		Irregular.		Total.			
	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).	No. of cases.	Av. length of period (days).
On the right side........	4	4.50	..	..	..	..	4	5.75	1	5.00	2	8.50	11	5.27	2	10.50	1	10.00	..	...	2	2.50	..	..	..	..	5	7.20	16	5.68
On the left side	4	4.25	2	7.50	2	2.50	8	5.55	9	4.77	6	6.33	31	5.41	3	7.00	..	...	1	10.00	4	3.00	..	..	..	..	8	5.27	39	5.41
On both sides	1	3.00	1	5.00	3	4.00	10	4.70	2	3.00	6	4.50	23	4.34	16	7.62	2	4.50	..	...	2	2.50	2	4.50	..	..	22	6.59	45	5.44
Backward	..	..	..	..	..	..	1	6.00	..	..	..	..	1	6.00	4	8.50	1	7.00	..	...	..	..	..	..	..	..	5	8.20	6	7.83
Not stated..............	10	4.80	1	12.	2	2.00	23	6.00	6	4.83	3	4.33	45	5.42	13	7.07	2	8.50	2	6.00	8	1.75	..	..	..	..	25	5.40	70	5.41
Not stated; perineum also lacerated..........	4	4.50	..	..	1	2.00	5	5.00	1	5.00	..	..	11	4.54	3	7.33	..	...	..	...	2	3.00	..	..	..	..	5	5.60	16	4.87
Not stated; perineum also lacerated, and uterus retroverted........	4	4.00	..	..	..	..	10	6.70	..	..	1	6.00	15	5.93	8	6.75	..	...	..	...	3	2.00	1	3.00	..	..	12	5.25	27	5.62
Total	27	4.44	4	8.00	8	2.87	61	5.83	19	4.63	18	5.56	137	5.19	49	7.45	6	7.16	3	7.33	21	2.28	3	4.00	..	..	82	5.98	219	5.49
Percentage	17.80						44.74						62.55		26.48						10.95						37.44			

It will, however, be of importance to study the subsequent changes in menstruation, as brought about by laceration of the cervix.

Table XXXV. shows the subsequent changes in duration of the menstrual flow in 219 cases of laceration of the cervix. We there see that but 17.80 per cent. of this number continued after the injury without change in the menstrual flow from what it was after puberty. This proportion was obtained from those who remained in after life normal, too free, or scanty in the flow, but in whom there had been no change in consequence of the injury. The same table, however, shows that with only 12.33 per cent. was the menstrual flow normal in after life.

Table XXXVI. shows that 130 women, or 79.26 per cent. of the 164 cases with laceration, had the flow increased or lessened in duration or amount in consequence of the injury. Eighty-two women had the flow increased from 4.68 days, as it was at puberty, to 7.07 days in after life. This number is there shown to be 63.07 per cent. of 130 cases with whom a change took place, or 50 per cent. of the total number with laceration, who had the flow increased in quantity. I can offer no explanation for the circumstance where we find the average length of the menstruation at puberty is so much greater for the forty-eight women, with whom the flow became lessened in after life, than for those who had it increased. It would have been natural to anticipate the opposite effect.

Table XXXVI.—*Epitome of Changes in the Duration of the Menstrual Flow in 130 cases of Laceration of the Cervix.*

Number of cases with the flow increased or lessened.	Changes in duration of menstrual flow.	In days.		Percentage	
		From	To		
		As to puberty	In after-life.	On the changes.	On the total number
82	Increased . . .	4.68	7.07	63.07	50.00
48	Lessened . . .	5.16	3.56	36.92	29.26
130	Changed . . .	4.86	5.70	....	79.26

We find at puberty the average length of the menstrual flow for these 130 women was 4.86 days. On taking the average for these women in after life, without regard to any change taking place in the increase or lessening of the flow, it will be found to be 5.70 days, thus showing that the general effect of the injury is to increase in after life the length of the menstrual flow by an average of nearly one day.

Table XXXV. may be considered in two portions. The first includes 137 women with whom the length of menstruation remained unchanged, or 62.55 per cent. of the total number. These are again subdivided: the first subsection is made up of 39 women in whom the flow, after the accident, remained unchanged as to time and quantity, or 17.80 per cent. of the total number. The second subsection consists of 98 women, constituting 44.74 per cent. of the whole number of lacerations. With these the length of flow remained unchanged, but the quantity increased, lessened, or became irregular. It may, therefore, be stated, that of the 137 women with whom the time remained unchanged, 28.46 per cent. continued to be normal, too free, or scanty, as they had been from puberty, while 71.53 per cent. had the quantity altered.

The second section is formed of 82 women who constituted 37.44 per cent. of the total number; with these both time and quantity had undergone a change after laceration of the cervix. Two subdivisions are also made here: in 26.48 per cent. the length of period became increased, and in 10.95 per cent. lessened. Again, of those with whom the time became changed, it was lengthened with 70.73 per cent., and lessened in 29.26 per cent. without reference to changes in quantity. The number of menstrual days is given for each condition, but in this respect the information is of limited value except for lacerations as a class, since for so large a proportion the locality of the injury had not been noted.

In conclusion of this subject a brief study of Table XXXVII. will prove of interest. Here we have the condition as to quantity treated of without reference to the length of the menstrual flow, the average duration for each condition being given merely as a coincidence. To reach the results for each condition shown by this table, we found first the number of cases, then the total number of menstrual days, afterwards the average duration of flow, and finally the proportions. But on making a comparison with Table XXXVI. it must be borne in mind that the two tables not only treat of different sets of cases, but that one records the effect of the injury on the length of menstruation, while the other treats of the quantity. For example: a woman may have had the length of the menstrual flow doubled, and yet the aggregate quantity may have been lessened. Again, the converse may be true, the duration of flow being shortened, and the quantity increased. With

Of these 33, or 20.12 per cent. of the total number, had cellulitis at the time of their first examination. It would, of course, be impossible to estimate what the proportion was of those who had recovered from an attack of cellulitis in the interval, since an average of over five years had elapsed between the birth of the last child and my first examination.

Eleven women, or 33.33 per cent. of all having cellulitis when first seen, had the menstrual flow increased; 16, or 48.48 per cent., had it lessened; while 6 women, or 18.17 per cent., suffered no change after the reception of the injury. Where the duration of the flow had been lengthened, the average increase was from 4.36 days, at puberty, to 6.63 days after the injury, while with a larger number the period was lessened from 5.50 days to 4.12 days. The average length of menstruation for the total number of those women who had cellulitis was 5.03 days at puberty, and but 5.14 days in after life, if the average be taken without regard to changes.

The unexplained circumstance already referred to is here again noted, that those women who had the menstrual flow lessened in after life began at puberty with the period of longer average duration than was the case with those where it became increased after the occurrence of the laceration. Future observation must determine how far the complication of cellulitis with lacerations of the cervix may lessen the average duration of menstruation, for it would be natural to suppose that this injury would tend rather to increase the flow. Its indirect effect also on the circulation, in bringing about early atrophy by a certain degree of obstruction, has yet to be studied. Experience has fully demonstrated the importance of recognizing its existence in connection with the proper treatment of lacerations of the cervix, and the subject will be treated of at greater length under the proper head.

CHAPTER XXIV.

DIAGNOSIS AND TREATMENT OF LACERATIONS OF THE CERVIX UTERI.

Diagnosis.—Lacerations through the neck of the uterus are more frequent occurrence than has been supposed. In fact, I doubt a woman can give birth to her first child without partial laceratio taking place; but if it is slight it heals rapidly and causes no difficult afterwards. Even most extensive tears are seldom recognized at th time of labor. The tissues are then so soft that, unless the rent h passed beyond the cervix into the vagina and connective tissues, can scarcely be detected by a mere digital examination. Indeed, th occurrence of the accident, in all probability, will not even be su pected, unless an unusual amount of hemorrhage should exist.

Lacerations in the median line are the most frequent, and tho through the anterior lip are more common than those in the posteri one. When in the median line and confined to the cervix, the lacerations generally heal rapidly, leaving scarcely a cicatricial li to mark their course. This is due to the fact that the necessa recumbent position of the patient, which is enforced for some ti after labor, keeps the raw surfaces in close contact by the pressure the lateral walls of the vagina until they have become firmly united

No serious consequences, therefore, are likely to follow this acc dent through the anterior lip of the uterus, unless the rent pas beyond the cervix through the septum into the bladder. Even wh most extensive, the line may heal throughout, as there will have be no loss of tissue from sloughing. This will frequently be the resu if proper attention has been paid to cleanliness, by the use of vagi injections of warm water, so as to prevent phosphatic deposits fro the urine on the raw surfaces.

But, as a rule, when the tear has been so extensive, a small vesic vaginal fistula will be left in front of the cervix. Or the laceratio through the neck will heal from above downward, and leave at th bottom of the fissure a sinus, along which the urine will escape fro the bladder into the uterine canal. Under the proper head this fo of fistula will be treated of at length. Lacerations through the anterior lip generally occur in women who have borne a number of children, and in whom there exists great relaxation of the abdominal walls, and anterior obliquity of the uterus.

Lacerations through the posterior lip unite as readily, and the accident may not be suspected, unless the fissure should have extended sufficiently into the posterior cul-de-sac to set up an attack of inflammation. When cellulitis occurs at this point, and from this cause, it always induces a most intractable form of retroversion. Even when a laceration has been superficial on the vaginal surface, the cicatricial band, felt as a cord, will contract and so shorten the cul-de-sac as to render it impossible to adapt any form of pessary to it. To restore the uterus to its natural position, a surgical procedure has to be resorted to for the removal of this band, often with most unsatisfactory results.

The history of the cases suffering from this form of laceration would indicate that the occurrence of the injury is due to the position of the occiput towards the sacrum. It is very rare, for bad effects remain after laceration either backward or forward, and when they do occur it is exceptional. When, however, the laceration is in a lateral direction, and extends beyond the crown of the cervix, a condition at once arises which will defeat all the reparative efforts of nature. In practice, therefore, we have to deal chiefly with the consequences of lateral lacerations, and the effects are more marked when the lesion is double than when confined to either side. Whenever the rent has extended to the vaginal junction, or beyond, there will exist a tendency for the tissues to roll out from within the uterine canal as soon as the woman assumes the upright position. The posterior lip of the cervix naturally catches on the posterior vaginal wall, as the uterus after a recent delivery is larger than natural, and lower in the pelvis from its increased weight. When the flaps formed by the laceration are once separated, their divergency becomes increased by the anterior lip being crowded forward in the axis of the vagina. This will be towards the vaginal outlet, in the direction presenting the least resistance, while the same force naturally crowds the posterior lip backwards into the cul-de-sac. From thus forcing the flaps apart, a source of irritation is at once established, which arrests the involution of the organ. The angle of laceration soon becomes the seat or starting point of an erosion, which gradually extends over the everted surfaces. With the increased size and additional weight of [illegible] congestion, the tissues gradually roll out as [illegible] of the internal os. As the laceration fre- [illegible] consequence of rapid labor, or from its having been [illegible] forceps or to use traction, the perineum is fre- [illegible] a want of the proper support, and with the [illegible] must occur so that the organ will lie on the [illegible] frequently some degree of retroversion. The [illegible] not regain its natural size, on account of the [illegible] still more dilated, as the uterus, from a want [illegible] to advance like a wedge towards the vaginal [illegible]

[illegible] laceration heals while the woman remains in bed [illegible] when she gets up, the surfaces soon become the seat [illegible] which bleeds readily. As the uterus begins [illegible] a profuse cervical leucorrhœa follows, and, i [illegible] frequent show, the patient seeks relief. She wi [illegible] stand with comfort, complaining of a continua [illegible] down her limbs, sometimes irritation of the [illegible] marked nervous disturbance.

[illegible] condition of laceration was universally mistaken [illegible] sometimes for the early stages of epithelioma, [illegible] of the uterus. To heal this “ulceration” [illegible] mode of treatment, or, if any improvement [illegible] patient's condition after a protracted rest in the re- [illegible] would follow again and again, with every [illegible]. Such a case passed from one physician to [illegible] the leucorrhœa ceased, and the profuse [illegible] as the surfaces, from the frequent application [illegible] became cicatricial in character. Never- [illegible] condition gradually became a confirmed [illegible] of the uterus remained, and from im- [illegible] health the nervous element became mos

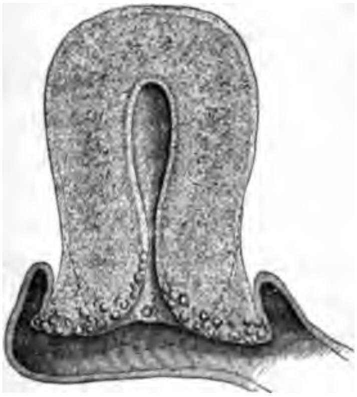
[illegible] left more to the reparative powers o [illegible] will be found to have gradually under- [illegible]. These little bodies can be felt like smal [illegible] numbers within the tissues of the cervix [illegible] and gradually empty themselves, [illegible] destroyed and their cavities disappear by [illegible] cervix was rather hypertrophied from the filling of these cysts, and as the inflammation and enlargement of the follicles extended within the canal, the extent of mucous membrane thus rolled out greatly increased. The cervix, however, and frequently the uterus itself, became gradually atrophied from the pressure exerted at first by the enlargement of the cysts, and afterwards by the contraction following their rupture. Occasionally the atrophy is confined to one flap, and when thus limited it is generally to the anterior one.

Eventually, when nature has been thus left to aid herself, the woman will frequently cease to menstruate at rather an early period in life, and will then gradually recover her health. Unfortunately, however, when the disease has existed so long as to induce a condition of profound anæmia, there remains no power in reserve to aid in bringing about a reaction, and phthisis becomes developed. Then, again, a woman in robust health may be able so far to repair the damage as to give birth to a number of children after the injury. She will manage to hold her position in good health for years, notwithstanding frequent menstrual hemorrhages and a wasting leucorrhœa between the pregnancies. But, finally, a change of life is completed, when epithelioma springs into existence from the seat of the old injury as a product of perverted nutrition.

Finally, in closing this description of the different forms of laceration, we must refer to one from within outwards, where the laceration does not extend through the thickness of the cervix. These are occasionally met with, and it is often exceedingly difficult to demonstrate that a laceration has taken place, although all the bad effects of the lesion are easily recognized. It would seem as if partial laceration took place from the internal os downward, on different sides, through the mucous membrane and deeper tissues, without extending to the vaginal surface of the cervix, making folds not unlike those between the ribs of a partially opened umbrella, which disappear when it is fully opened out. Through the patulous os and canal the mucous membrane is seen prolapsed, and its appearance is like that presented after dilating with a sponge tent a partial contraction of the canal which had taken place above, but had not yet extended to the external os. The cervix is frequently but little enlarged in diameter, but its walls are seen to be thinner than natural. The cervical discharge is most profuse and tenacious. The menstrual flow remains too free, and is often irregular, and the uterus is found larger than normal.

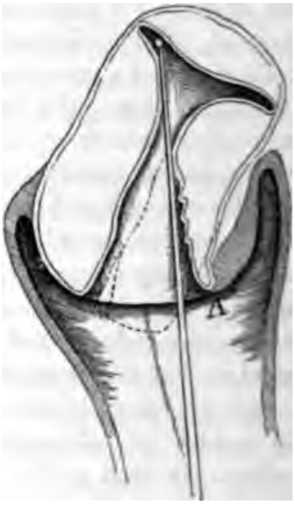
After labor, the whole organ being in a state of fatty degeneration and the tissues of the neck soft, these flaps, in a double laceration, flatten against the posterior wall of the vagina or floor of the pelvis, so that all appearance of laceration becomes lost. So perfect is the deception that it is frequently impossible for any one not familiar with the condition to recognize the existence of a laceration by an ocular examination alone. If a patient be placed on the back, and a digital examination made, the true condition can be easily appreciated. When there is simple hypertrophy of the uterus the finger can easily ascertain that the body of the uterus above is as large as the cervix below. But with double laceration of the cervix, when the finger is passed up behind the uterus into the cul-de-sac, or in front, it will be found that the cervix is much larger than the body. The relative size of such a cervix to the body of the uterus is about that of the top of a half-grown mushroom to its stem. If the patient be placed on the side, and the speculum introduced to bring the cervix into view, these flaps can be rolled in. By seizing the anterior and posterior lips of the cervix with a tenaculum in each hand, and then bringing them into apposition, the inverted portion will roll in toward the canal. The shape of the neck will then be represented by the

Fig. 80.



Internal laceration of the cervix.

Fig. 81.



Unilateral laceration, producing obliquity of the uterus.

dotted line in Fig. 80, and it will be found that its size is but little larger than natural.

When the laceration has been complete, but confined to one side, the rolling out is not so extensive, nor is the apparent size of the cervix so large as in the previous condition, but it is as difficult often at first sight to detect the injury. A partial obliquity of the uterus in the pelvis is thus produced by crowding the cervix towards the uninjured side, and this surface and the flattened lacerated portions may present a common plane to the posterior wall of the vagina on which it rests. As the flaps separate, the two edges and the uninjured side form a tripod, with two legs shorter than the third one, so that the fundus must necessarily be tilted toward the injured side (see Fig. 81). Cellulitis is a most common result of this accident, and is generally situated between the folds of the broad ligament on the side of the laceration. The effect of the cellulitis is to shorten the ligament, and the fundus will be fixed towards the injured side. This causes the parts which have been torn down to the vaginal junction, or beyond, to project into the passage, and as they are covered by a reflexion of the vaginal tissue over this part of the uterine body, just above the terminating point of the laceration (see Fig. 81), the effect to the eye is a length of cervix on that side equal to the uninjured portion. The apparent os is always more patulous than in health, and this condition is readily accounted for from the evident existence of disease within the uterine canal. Moreover, the deception is still maintained by the passage of the sound in the median line to the fundus, for its use gives no indication of the true condition. The explanation is that the sound passes through a patulous os, along the angle of the rent on one side of the cervix, to the horn of uterine canal on the opposite side. As is shown in Fig. 81, these two points are brought, by the abnormal position of the uterus, into line with the axis of the vagina. So deceptive is the condition, that I have been frequently consulted as to the propriety of amputating an enlarged or elongated cervix, when if a small portion only of the apparent enlargement had been removed, the peritoneal cavity would have been opened. The cervix is never so large as it seems to be, and the line of junction with the vagina is equally deceptive. It is, therefore, a wise procedure, in any doubtful case, to place the patient for examination on her knees and elbows. On the introduction of the speculum the vagina becomes distended by atmospheric pressure, and by the aid of gravity the uterus is brought into its proper position. The true line of junction with the vagina will be then well marked, and only the actual length of the cervix will project above the vaginal surface. In a case of laceration on one side, extending to or beyond the vaginal junction, the fissure will be detected without difficulty, in this knee-elbow position. By the weight of the uterus its axis in the pelvis will be brought in line to correspond with that of the vagina, so that the depth of the cleft through the tissues can be appreciated at a glance.

TREATMENT.

The chief purport of treatment is to bring about union of the lacerated surfaces, and the question naturally presents itself as to the circumstances under which an operation is called for. I would state that in every instance where the condition is evident, and where enlargement of the uterus still remains, or where the woman suffers from neuralgia, I consider an operation necessary, notwithstanding the parts may have completely healed.

Every case of laceration is benefited by some preparatory treatment previous to the operation. The uterus, from its increased weight, and while resting on the floor of the pelvis, will, by traction on the cellular or connective tissue, obstruct the circulation sufficiently to produce not only increased congestion of the organ itself, but also of the neighboring tissues. To give tone to the vessels and relieve the congestion, large hot-water vaginal injections must be used once or twice a day, until all tenderness on pressure, which may have been detected by means of the finger, has disappeared. To hasten this the frequent application of iodine to the abdominal wall, or a small blister, is of great benefit when made over the seat of the cellulitis. If a broad ligament has become thickened and shortened from the previous inflammation, the whole weight of the uterus will be thrown upon it whenever the woman is in the upright position. As has been already stated, an old cellulitis is frequently kept up, as it were, from this single source of irritation not being appreciated. One of the first steps to be taken in the treatment of this condition is to fit some instrument which will lift the organ from the floor of the pelvis. Where a closed lever pessary can be used, it best answers the purpose, since it can remain undisturbed. The uterus must be first anteverted by means of the index finger in the vagina, and the pessary be then so curved as to hold the organ in this position. This is important, for by keeping the uterus anteverted the flaps cannot gape apart to any extent, and in preventing this we remove a source of irritation. To fit the pessary properly requires some judgment, for if, as has been shown, the uterus be lifted too high in the pelvis, we again put the shortened broad ligament on the stretch and produce a condition we wish to avoid. The best guide is the sense of relief felt by the patient, and her unconsciousness of the presence of the instrument. Frequently it is necessary to make the pessary more narrow where it comes in the neighborhood of the thickened broad ligament. In this condition, if the sides be left straight, as is usual, the instrument will cause lateral pressure on the vaginal walls, and so much irritation that it may have to be abandoned. We may then employ the hard rubber pessary, which was described in the chapter on Cellulitis, or the India-rubber inflated ring pessary. The advantage of the latter instrument is that if it is introduced with the flaps of the laceration in contact, and the uterus anteverted, they cannot again separate. Any downward pressure has the tendency to crowd the cervix toward the opening in the centre of the ring, while the aperture is not large enough in diameter to allow any portion to become strangulated. The instrument should be by no means the size of the already over-stretched vagina, for, if it were, it would but dilate the passage the more. It is to be used merely as a temporary cushion; and as there is likely also a laceration of the perineum, which would allow of a prolapse of the vaginal walls, the instrument must be kept in place by a T bandage.

In addition to the vaginal injections, the local treatment will include the application of Churchill's tincture of iodine, about twice a week, with frequent glycerine dressings. Or tannin and glycerine may be applied to the parts every other day. Glycerine is preferable to water as a vehicle, since it increases the action of the tannin, and brings about capillary contraction. Where the surfaces have become covered by granulations and bleed readily, an application may be made about once a week of the subsulphate of iron, or Monsel's salt. These applications should be made just after the vaginal injections, and after removing the secretions with a syringe as thoroughly as possible. The parts can then be well dried by means of small pieces of old linen laid between the flaps, and removed as the application is made. It is advisable to separate thoroughly the flaps before applying the preparation of iron, that the powder may be dusted over the whole denuded surface. But after the application has been made, the lips must be again brought together, the uterus anteverted, and, when possible, the patient should be kept in the horizontal position for several hours afterwards. When the circumstances are such that the will be then well marked, and only the actual length of the cervix will project above the vaginal surface. In a case of laceration on one side, extending to or beyond the vaginal junction, the fissure will be detected without difficulty, in this knee-elbow position. By the weight of the uterus its axis in the pelvis will be brought in line to correspond with that of the vagina, so that the depth of the cleft through the tissues can be appreciated at a glance.

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The chief purport of treatment is to bring about union of the lacerated surfaces, and the question naturally presents itself as to the circumstances under which an operation is called for. I would state that in every instance where the condition is evident, and where enlargement of the uterus still remains, or where the woman suffers from neuralgia, I consider an operation necessary, notwithstanding the parts may have completely healed.

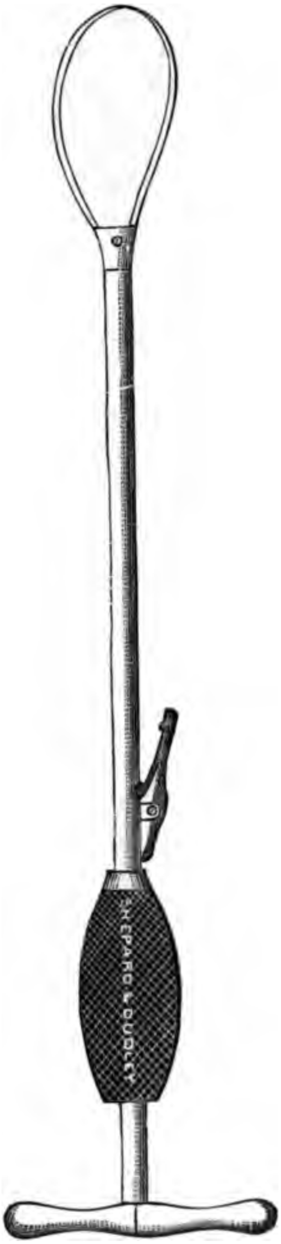
Every case of laceration is benefited by some preparatory treatment previous to the operation. The uterus, from its increased weight, and while resting on the floor of the pelvis, will, by traction on the cellular or connective tissue, obstruct the circulation sufficiently to produce not only increased congestion of the organ itself, but also of the neighboring tissues. To give tone to the vessels and relieve the congestion, large hot-water vaginal injections must be used once or twice a day, until all tenderness on pressure, which may have been detected by means of the finger, has disappeared. To hasten this the frequent application of iodine to the abdominal wall, or a small blister, is of great benefit when made over the seat of the cellulitis. If a broad ligament has become thickened and shortened from the previous inflammation, the whole weight of the uterus will be thrown upon it whenever the woman is in the upright position. As has been already stated, an old cellulitis is frequently kept up, *as it* were, from this single source of irritation not being appreciated. One of the first steps to be taken in the treatment of this condition is to fit some instrument which will lift the organ from the floor of the pelvis. Where a closed lever pessary can be used, it best answers the purpose, since it can remain undisturbed. The uterus must be first anteverted by means of the index finger in the vagina, and the pessary be then so curved as to hold the organ in this position. This is important, for by keeping the uterus anteverted the flaps cannot gape apart to any extent, and in preventing this we remove a source of irritation. To fit the pessary properly requires some judgment, for if, as has been shown, the uterus be lifted too high in the pelvis, we again put the shortened broad ligament on the stretch and produce a condition we wish to avoid. The best guide is the sense of relief felt by the patient, and her unconsciousness of the presence of the instrument. Frequently it is necessary to make the pessary more narrow where it comes in the neighborhood of the thickened broad ligament. In this condition, if the sides be left straight, as is usual, the instrument will cause lateral pressure on the vaginal walls, and so much irritation that it may have to be abandoned. We may then employ the hard rubber pessary, which was described in the chapter on Cellulitis, or the India-rubber inflated ring pessary. The advantage of the latter instrument is that if it is introduced with the flaps of the laceration in contact, and the uterus anteverted, they cannot again separate. Any downward pressure has the tendency to crowd the cervix toward the opening in the centre of the ring, while the aperture is not large enough in diameter to allow any portion to become strangulated. The instrument should be by no means the size of the already over-stretched vagina, for, if it were, it would but dilate the passage the more. It is to be used merely as a temporary cushion; and as there is likely also a laceration of the perineum, which would allow of a prolapse of the vaginal walls, the instrument must be kept in place by a T bandage.

In addition to the vaginal injections, the local treatment will include the application of Churchill's tincture of iodine, about twice a week, with frequent glycerine dressings. Or tannin and glycerine may be applied to the parts every other day. Glycerine is preferable to water as a vehicle, since it increases the action of the tannin, and brings about capillary contraction. Where the surfaces have become covered by granulations and bleed readily, an application may be made about once a week of the subsulphate of iron, or Monsel's salt. These applications should be made just after the vaginal injections, and after removing the secretions with a syringe as thoroughly as possible. The parts can then be well dried by means of small pieces of old linen laid between the flaps, and removed as the application is made. It is advisable to separate thoroughly the flaps before applying the preparation of iron, that the powder may be dusted over the whole denuded surface. But after the application has been made, the lips must be again brought together, the uterus anteverted, and, when possible, the patient should be kept in the horizontal position for several hours afterwards. When the circumstances are such that the atient is unable to keep quiet after the application, it is a good plan o place in the posterior cul-de-sac a proper sized pledget of damp cotton, and another in front of the anterior lip. These cotton pledgets are for a day or two to take the place of the instrument, which would be injured by contact with the iron, while at the same time they will protect the patient's linen. As a rule, I leave the tampon undisturbed for forty-eight hours, and have the vaginal injections omitted for the same length of time.

After a double laceration of the cervix, a partial constriction is often produced in the neck as the parts cicatrize, and especially is this the case when the tear has passed beyond into the vaginal tissue. This is often sufficient in extent to obstruct the circulation in the flaps when aided by cystic degeneration of the mucous follicles. Consequently the flaps become almost strangulated; the effect, in fact, is similar to paraphimosis. The next and most important step in the preparatory treatment is to relieve this congested condition by puncturing the cysts. A small, lance-shaped knife is needed for the purpose. It is not necessary to pick out each individual cyst. The whole lacerated surface may be gone over by little stabs in every direction, and the point of the instrument will penetrate the distended cysts more easily than it will enter the tissue of the cervix. Scarcely an ounce of blood will be lost under any circumstances, but from emptying the cysts, and from this bleeding, the size of the flaps will be greatly reduced. Churchill's iodine is then to be freely applied over the surface in which the cysts have been punctured. After this has been done, the flaps are to be brought together and kept in contact by a portion of cotton saturated in glycerine, which will crowd the neck into the posterior cul-de-sac. These scarifications are to be repeated again and again, and the iodine applied from time to time until the cysts have all disappeared, the flaps reduced in size, and the erosion greatly lessened in extent or healed. I have frequently resorted to the use of a silver wire, passed through each flap at about half an inch from the edge; by twisting the two ends until the lacerated surfaces are brought just into contact, much will be gained by thus temporarily preventing the parts from rolling out. This plan, however, can only be resorted to while the patient remains quiet, for if she were exercising, the wire would soon cut out, or act as an irritant.

If the operation be performed after the different sources of irritation have been removed, the uterus will be reduced rapidly in size, and

Fig. 82.



Uterine tourniquet.

the patient will not only regain her health, but will remain in the full enjoyment of it afterwards. So long, however, as there can be detected, by pressure with the finger, any tenderness in the neighboring connective tissue, it is not safe to operate. We may feel fully satisfied that a certain amount of cellulitis has previously existed, and a condition is still remaining which would require but a slight provocation to re-establish the inflammation.

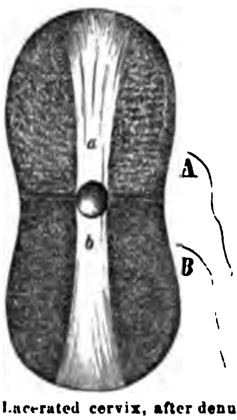
The usual mode of operating is to place the patient on the left side, and to use Sims's speculum, or some other perineal retractor, to bring the parts into view. The operation can sometimes be performed on the back, when the vaginal outlet is large, since the uterus is then so low that it can be readily drawn outside and returned after the operation. But the left side has this advantage, that while the patient is in this position, there can be less rolling out of the tissues than in any other, except in the knee-elbow position.

The first step is to bring the flaps together in apposition, and while they are lifted up by means of the double tenaculum in the hands of an assistant, the uterine tourniquet, Fig. 82, is to be slipped over the cervix below the point of vaginal junction and tightened. The object of this instrument is to control the hemorrhage during the operation, as it is sometimes excessive. Until I had this instrument made, I used a portion of twisted wire, such as is usually furnished for the écraseur, the two ends of which were passed through a canula. The loop was slipped over the neck of the uterus, while being held by an assistant, and tightened by sliding the canula down the wires held in the other hand. As soon as the cervix was compressed as much as possible by this means, the ends of the wire were bent back, and several times wrapped around the end of the canula, so that they could not slip. The instrument above mentioned has, instead of the wire, a portion of watch spring passed through a canula, and in the handle is the double ratchet of the écraseur to tighten the loop about the cervix. Just before constricting the neck with either instrument, I take the precaution to draw up with a tenaculum, through the loop, sufficient vaginal tissue all around the cervix to enable the flaps to be brought together easily. The fold thus formed renders the instrument less likely to slip over the cervix when it has become reduced in size from the escape of blood during the operation.

Until recently I regarded this uterine tourniquet as essential in every operation for closing a lacerated cervix. I now confine its use entirely to operations when the tissues of the cervix are unusually soft, since I have learned from experience that the loss of blood is likely, in such cases, to be very great. But under ordinary circumstances I have found that the administration of a large hot-water vaginal injection, just before the operation, will so far lessen the bleeding that the tourniquet can be dispensed with.

After separating the flaps fully, the surfaces which have been torn, in a double laceration, are to be freely denuded from one lip to the other, leaving a broad undenuded tract in the centre, from before backward, which is to form the continuation of the uterine canal from the os. This undenuded portion on each flap is made to correspond with that on the opposite side, and should widen gradually from the edge of the uterine canal towards the outer edge of the divided portion of the cervix, as shown in Fig. 83. Therefore, when the two flaps are brought together, the new canal through the cervix will be trumpet-shaped. As the uterus gradually returns to its normal size (and the change will be the most marked in the cervix), this new canal will become of a natural and uniform diameter throughout. To make this canal of a proper size, we must be guided by the amount of hypertrophy in the flaps. It must bear some relation to the increased size of the flaps, and the trumpet shape is necessary,

Fig. 83.

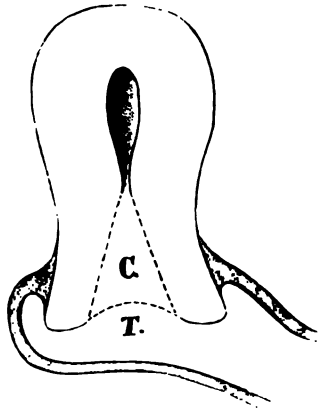


Lacerated cervix, after denudation.

since the hypertrophy increases in degree from the bottom of the laceration towards the outer edges of the flap.

Either the scissors or the scalpel may be used to freshen the surfaces, but I prefer the scissors, for the greater rapidity with which the tissues can be removed with them. It is necessary when freshening the surfaces to remove very superficially the tissues near the outer angles of the fissure, just at the vaginal junction, unless the laceration should have been a very extensive one. The circular artery, owing to its elasticity and its position in loose connective tissue, is seldom ruptured when a laceration of ordinary extent takes place. But as the parts contract after cicatrization, it is frequently left just at the termination of the angle of the fissure with the vaginal tissues. When the tissues are dense, I sometimes have to use a scalpel to denude the angle at the bottom of the laceration, when confined to one side. We frequently meet with cases where nature has attempted to repair the injury, and to prevent the gaping of the flaps, in a double laceration, by filling in the angle on each side by granulations as the parts have healed. The result is that a dense cicatricial plug (C, Fig. 84) remains. When this condition exists, there is always much disturbance of the nervous system, and frequently it is the exciting cause of neuralgia in other parts of the body through the medium of the sympathetic.

Fig. 84.



Cicatricial plug in a lacerated cervix.

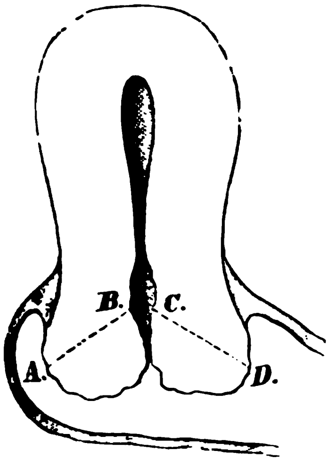
It is important to draw particular attention to this condition, that its existence may not only be recognized, but the necessity for its removal fully appreciated. Apparently the limit of the laceration is along the dotted line T, and the extent of injury seems very superficial, when, in fact, it may have been very deep. When this surface only has been denuded and the sutures introduced, the operator will be surprised at the difficulty experienced in bringing the parts properly together. Let the reader place an ordinary sized wooden spool in the angle between two of his fingers and then attempt to bring together the sides of these fingers. It can be done by force, but it is at once realized that the circulation becomes obstructed; and so the lips of a laceration would meet with similar resistance if this cicatricial plug is shut up between them, and any sutures introduced through them would be likely to cut out. When the parts have been thus closed, shutting up this mass of cicatricial tissue, there will be no improvement even should they unite perfectly. The uterus will remain quite as large as before, and frequently will even increase in size. The appearance of the neck will show that the circulation is obstructed, and as nature must attempt to relieve this by an increase of secretion from the uterine canal, an erosion soon forms. A fresh attack of cellulitis is not an unusual occurrence, since the position of the uterus will have been disturbed to an unusual degree, in consequence of the great difficulty experienced in the introduction of the sutures through this dense tissue. Finally, there will be a marked increase of the anæmia and the neuralgia, owing to the additional irritation to the nervous system, and nutrition becomes still further impaired. The only remedy is to remove the whole mass on both sides in a V-shape, and to secure the surfaces thus made with sutures, as in the operation for double laceration. But one precaution is necessary, and that is to disturb the position of the uterus as little as possible, since so extensive a laceration must have produced cellulitis at the time of the occurrence. If the uterus be then dragged down at the operation, the force of the traction must be spent on the shortened broad ligament, and a fresh attack of cellulitis will be the consequence.

Under other circumstances, when the case has been of long standing, many cysts will have formed and ruptured, from which cause contraction takes place along the edge of the mucous membrane of the canal and vaginal surface. The effect of this contraction is to convert the former flat sides of the flaps into two convex surfaces in apposition with each other. Were we simply to freshen these surfaces in a superficial manner, and then attempt to bring them together, we would fail to approximate the outer edges properly, unless the sutures were twisted so tight that they would cut out. This tissue is cicatricial, and constitutes so dense a foreign body that, were we to succeed in obtaining union, it could be only temporary, for the previous condition would soon be reproduced through want of vitality.

Not only is it necessary to remove entirely this projecting surface, but even partially to excavate, that the sides of the flaps may be brought into close contact throughout, when the sutures have been secured. The lines A B, and C D, Fig. 85, indicate the portion to be removed, but this removal is not to extend entirely across the flap, for if this were done, there would be a complete closure of the cervical canal. Nor is the removal necessary to this extent, since the hypertrophied portion is chiefly that part which is shown in Fig. 85, and represents the amount to be denuded.

This will be made more evident by reference to Fig. 86, which shows a horizontal plane, as it were, of the cervix. Here the hypertrophied tissue is indicated by A B, C D, and is to be removed to the bottom of the laceration, along the dotted lines, so that the lines A and B, C and D, can be brought together by sutures. The same precaution in regard to pulling the uterus down, as was urged in the previous condition, must be observed here also, through fear of exciting cellulitis.

Fig. 85.



Cicatricial hypertrophy after laceration.

Fig. 86.

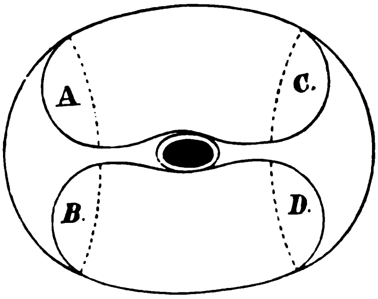


Diagram of surfaces to be denuded.

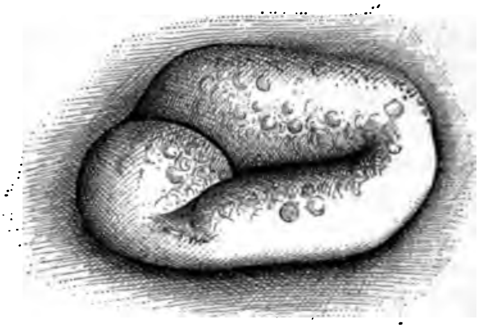
The cervix is sometimes lacerated in a bifid form, or into three, and even four sections. Were we to denude between each cleft, and then attempt to bring all these flaps together, the result would be, in all probability, a failure, since the traction in opposite directions would cause the sutures to cut out.

One or more of these flaps is usually hypertrophied and much out of proportion to the rest, so that it would be difficult to approximate the surfaces properly. But a glance at Fig. 87 will show that on removing a small segment, by a V-shaped incision, it would be easy afterwards to bring together the freshened surfaces, so that both the cervix and canal would be restored to a normal size.

When lacerated into four sections I have removed on each side a segment, and then brought the remaining flaps together as in a double laceration.

With a knowledge of this principle, it will require but little stu of any individual case to realize almost at a glance the proper cour to pursue.

Fig. 87.



Bifid laceration of the cervix.

When it is safe to do so, the process of freshening the surfaces is very much facilitated by drawing the uterus gently down towards the vaginal outlet, and then having the organ steadied by a strong tenaculum in the hands of an assistant. The nearest portion, or that which is the lowest, should be removed first, since by doing so the view is less obstructed by blood running over the surface. The portion to be removed is to be hooked up with a small tenaculum, and the strip kept on the stretch, while it is being separated, and if possible it should be removed in a single piece from the side of one flap to the other. This is the best plan to insure the denudation of the whole surface when the oozing of blood is at all free. With the use of either the knife or scissors, the freshened surfaces should be made as smooth as possible, and uniform in extent. The best results are obtained when we get union by the first intention, but to gain this it is necessary that the parts should be approximated with some degree of accuracy, for a projecting edge, left to heal by granulation, cicatrizes and afterwards contracts. The presence of a cicatricial cord across the cervix may give rise to as much disturbance as the original difficulty.

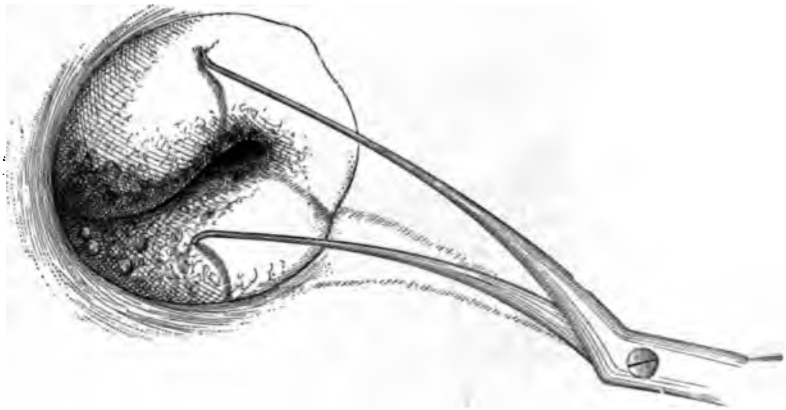
When the injury has been of long standing, and the tissues have become dense, the chief difficulty in the operation is experienced in passing the needles. The short round needle, which I was the first to use for operations about the vagina, has the advantage of making only a punctured wound. When the suture is introduced, it so fully occupies the tract, as was stated when treating of operations on the perineum, that there is little danger of oozing of blood, which is of frequent occurrence after the use of the needle with a cutting edge. But the more dense and indurated the tissue, the less vascular will be the parts. Under these circumstances, the lance-pointed needle, being easier of introduction, answers best for the purpose ; but if the tissues are soft, the round needle should be used. Three or four sutures are required for each side, if the laceration be extensive or double. They should be introduced, as illustrated in Fig. 83, from A, at the outer portion of the flap, to *a*, at the edge of the surface which is to form the canal, and then, from within outwards, through the other flap from *b* to B, so as to correspond. The chief object, however, is to make an accurate approximation along the vaginal surface, since the edges forming the canal will be kept in contact much as the inner edges of the staves of a barrel are by a properly fitted hoop. When the bleeding has been troublesome, it is advisable to pass the first suture through the vaginal tissue, a short distance below the angle of the laceration. The circular artery, or its branch, from which the oozing generally comes, will be secured by this plan. When the laceration is a double one, the sutures for the opposite side must all be introduced before securing those already passed, or great difficulty will be experienced; and should there be an unusual amount of bleeding, it can be arrested by twisting the interrupted suture nearest to the bottom of the angle. Before doing so, however, it would be better, where the tourniquet has been used, to see if the hemorrhage cannot be controlled by tightening this instrument, as it may have become loosened in consequence of the shrinkage of the neck after the escape of the blood which was confined within the tissues when the instrument was first applied.

The mode of securing the sutures by twisting has been fully described under the head of "silver sutures and mode of introduction." If the sutures are properly bent over, so as to lie close to the surface of the neck, and are cut off at half an inch in length, they may remain undisturbed for an indefinite time without causing irritation. I have met with several cases where the bleeding was profuse on removing the tourniquet after completion of the operation, but in each instance it was arrested promptly by an injection of hot water administered before the effects of the anæsthetic had passed off.

To close a laceration on one side only, is rather more difficult than if it were a double one. This is in consequence of the difficulty of properly denuding the angle, and of freeing it from cicatricial tissue. The double tenaculum in the hand of an assistant will be found useful to keep the flaps apart, and to steady the uterus while the angle is being denuded with either scissors or scalpel (see Fig. 88).

It is well to institute some preparatory treatment in cases of multiple or stellate laceration, Fig. 89, but, as a rule, little benefit will result except from the use of strong solution of chromic acid or some other agent which will cause the canal to contract. If this, however, were all there is to be accomplished, the use of the cautery would be the most prompt and efficient means, not only to cause the canal to contract, but to heal rapidly the erosion, thus checking the profuse cervical leucorrhœa and free menstrual flow. But after having accomplished this by such means, it is evident that the mucous membrane will be entirely changed in character, if it is not destroyed.

Fig. 88.



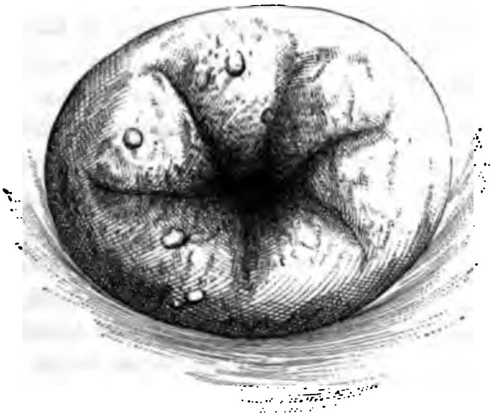
Double tenaculum, separating the flaps of a laceration.

An operation will be necessary, should the injury be so extensive as not to yield, after a reasonable time, to the application of iodine, the spirits of turpentine, the acetic solution of cantharides, or any other remedy which might be employed for the purpose of bringing about a new action in the prolapsed and lacerated tissue, without, at the same time, destroying its integrity. The operation in itself is simple, the cervix being divided with a pair of scissors, on each side, to the vaginal junction, thus bringing about, as it were, a double laceration. It will then be necessary to increase the area of the denuded surfaces by removing a sufficient amount of tissue on each side, so that the canal will be restored to a normal size when the flaps have been brought together with sutures.

The subsequent treatment will be the same for any form of laceration, and will consist in confining the patient to bed for two weeks after the operation, for fear that the flaps may separate, while perfect rest in the horizontal position will facilitate the decrease in the size of the uterus.

There will generally be no necessity for keeping the bowels constipated, nor for restricting the diet, provided its quantity and quality be suitable for one remaining in bed. The bladder should be emptied by means of a catheter, or a bed-pan should be used. But when the urine has been passed on the bed-pan, a little warm water should always be injected into the vagina immediately afterwards to prevent any urine which may have entered the canal from remaining in contact with the uniting surfaces. In addition, on the second or third day after the operation, a vaginal injection of tepid water should be given once a day, or night and morning, if there should be much discharge.

Fig. 89.



Multiple, or stellate, laceration of the cervix.

The sutures are generally removed on the seventh day, and some care is needed in withdrawing them, as the line of union is frequently weakened by carelessness in doing so. When the patient is placed on the left side, and the cervix has been brought into view by the use of Sims's speculum, the lower portion of the loop should be cut close to the end of the twist, and then withdrawn. Each portion of the loop will then bind together the parts until it has been removed, while if we should cut the upper part and make traction, the surfaces would be drawn asunder. It is best to remove first the suture nearest to the vaginal junction, for if there should be any tendency to gape in the line, the others can be left for several days longer, so that the ununited portion may heal by granulation.

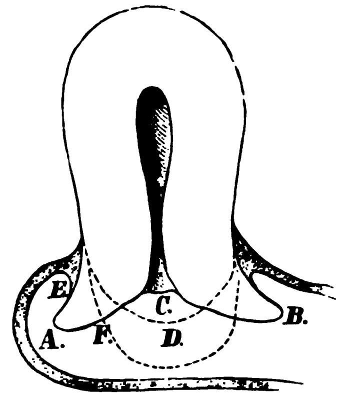
It is of great importance that the patient should not sit up in bed for ten or twelve days after the operation. A portion of the line is very apt to separate after the sutures have been removed, if this be neglected. Moreover, to get up would expose her to the effects of cold, and cellulitis, if it has existed, is likely to recur on a slight provocation.

When retroversion has existed, and a pessary has been used, it is best, as a rule, to remove it at the time of the operation, and to replace the instrument only when the patient begins to stand on her feet. If the uterus is left anteverted, as it should be after the operation, and then replaced by the finger if necessary when the sutures are removed, it will generally remain in this position while the patient is in bed. But should the uterus be allowed to become retroverted again, it will be crowded lower into the vagina as soon as the patient begins to exercise. Traction will be at once made by the walls of the vagina on the anterior and posterior flaps. The result will be that the original condition will be reproduced. Or, on account of obstruction to the circulation, the hypertrophy of the uterus will increase, and an erosion will soon form on the cervix which will ultimately extend to the uterine canal. This most important feature in the treatment, viz., the necessity for placing the uterus in a proper position, is frequently overlooked; it is not only necessary preparatory to the operation, but it is a very essential means for obtaining beneficial results afterwards. After the sutures have been removed, the uterus will decrease rapidly in size if there exists no cause of irritation to arrest its progress. Therefore to favor this change an early resort to some mechanical support is advisable, to lift the uterus from the floor of the pelvis, and to keep it anteverted if possible. The instrument used previous to the operation will now be found too large, but in any event a smaller one should be employed if possible, that the vagina may return to its natural size from the over-stretched condition induced by the prolapse.

As soon as the patient has sufficiently regained her health, and other circumstances will admit of it, the lacerated perineum, if a laceration has existed, should be closed, and, if necessary, the operations on the vaginal walls should be performed for restoring the canal to its normal size. These operations should be done afterwards, for it is not good practice to attempt to operate on the lacerated cervix and at the same sitting close the perineum. After the patient recovers from the latter operation, the question will arise as to the necessity for some modification in the size and shape of the pessary which had been previously worn, or as to the propriety of discontinuing its use. As a rule, there will be no need for any local treatment afterwards if she has undergone the proper preparation for the operation. Then with the improvement in the general condition all discharge will cease, and the uterus will gradually regain its normal size.

A condition is sometimes found after the operation for which I cannot yet offer a satisfactory explanation. Fig. 90 represents a double laceration, and at *C* is shown what, in consequence of the distance to which the laceration seems to have extended (from *A* and *B*), is supposed to be the internal os. We will suppose an ordinary case as to relative measurements, and that the depth of the uterine canal from *C* is three and a half inches, while the length of each flap is (from *C* to *A* and *B*) an inch and a half more. Now, were we to denude these flaps and bring the surfaces together with sutures, the natural inference would be that they must occupy the space included by the dotted line *D*, and the depth of the canal would then be five inches. Such, however, is not the case, for although we may unite these flaps, and apparently add an inch and a half to the depth of the canal, there will be but little increase from what it was before the operation. In other words, when the flaps *A* and *B* have been united, they will come together at *C* instead of at *D*, with but little increase, and sometimes with even a slight decrease in the length of the canal after the operation.

Fig. 90.



Effect of laceration involving the vaginal wall.

The only explanation I can offer is based on the supposition that the laceration is limited to the cervix and does not reach the body; that it involves chiefly the vaginal wall, and is never so extensive as seems apparent to the eye. When we see a laceration through the cervix apparently extending upward into the uterus for an inch and a half, it is probable that two-thirds of the length of the tear is in reality on the vaginal wall. As the enlarged uterus prolapses in the canal after the injury, it of course carries with it a reflection of the vaginal walls like a stocking which becomes doubled on itself. Therefore, when *A* is supposed to be drawn to *C*, this doubling up of the tissues is pulled out, and *A* will then occupy about the position of *E* on the vaginal wall. If this be true the cervical flap does not extend to *A*, and, in all probability, not beyond the dotted line at *F*. We may then suppose that the difference is due to the fact that the vaginal tissue covering the circumference of the cervix has become thickened in consequence of the laceration. When the sides of the laceration through the cervix are brought together, the effect is to draw out, as it were, the neck from this surrounding, and the vaginal tissue looks as if it had retracted sufficiently to leave the cervix exposed. If this is the explanation, there can be comparatively little gaping of the cervix itself; yet there is quite enough to cause much disturbance, but not so much as would be were the injury to the uterus greater. The rent through the neck of the uterus is in reality a small portion of what seems to be the depth of the fissure, and to this we may attribute the little change found in the length of the canal after the operation. It is evident that when these flaps are united the excess of tissue is stripped back from the cervix, and the line of union is then chiefly in the vaginal wall.

It will frequently happen, with an extensive laceration, that the tissue forming the top of the fissure at the vaginal surface, and nearest to the observer, will be the most distant when the sutures have been secured. This can be explained by the diagram, Fig. 91. We will suppose *A B C* to represent a recent fissure through the

Fig. 91.

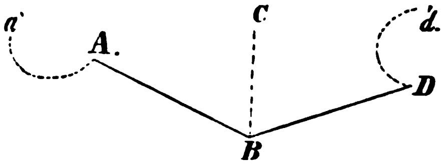


Diagram of laceration involving the vagina.

cervix, terminating in the uterine canal at *a'*. *C* is the vaginal edge of the fissure, and *B* forms the angle nearest to the vaginal outlet. It is held that the curved line *A a'* is the extent of the laceration in the cervix, while *A B C* is vaginal tissue in front of it. But when the sutures are closed, the vaginal tissue becomes crowded back, and the point *A* advances to *D*, while *B* remains stationary, so that the curved line *d' D*, the limit of the true laceration, and which as *a' A* was previously at the bottom of the fissure, is now in front. Before the change, the line of laceration *A B* extended into the vaginal tissue which then covered the cervix. But now, when the change from *A* to *D* is made, the line *D B* becomes in fact part of the vaginal wall. It lies against the side of the uterus, but since it is drawn out it is now but a superficial continuation of the line of laceration, without depth yet apparently as extensive as before.

It is not unreasonable to suppose, in consequence of the continued irritation dependent on the laceration, that a condition of congestion is kept up in this erectile tissue, and may be termed an erection of the uterus. In consequence of the loss of blood at the time of the operation, and of the subsequent removal of the source of irritation, this state of erection will gradually cease, so that the uterine canal may shorten from an inch to an inch and a half in the course of ten days, as I have frequently observed.

As soon as the practitioner becomes able to recognize this lesion under its different forms, he will be surprised to find a new explanation of all his cases of elongated or hypertrophied cervix, as well as those of ulceration. Let him in all such cases simply make the attempt, with a tenaculum in each hand, to bring the points *A* and *B* (Fig. 90) together at *C*, and a revelation will be opened to him. It will be necessary to employ Sims's speculum, or some instrument of the same kind, for otherwise the condition will not be detected. This I believe to be difficult with any valvular or cylindrical instrument, for these put the parts on the stretch. To this fact is doubtless due the difference of opinion which exists to-day as to the frequency of this injury. But let any one once master the diagnosis, and he will not fail to recognize the protean nature of lacerations, and will never see another case of hypertrophied cervix, or a so-called elongated neck. Moreover, he will never have occasion afterwards to amputate the cervix, or any portion of it, except for malignant disease. This has been my experience during the past nine or ten years, and in so large a practice that, if hypertrophy and elongation existed in reality, I could not have failed to recognize them. What observer has ever met with either of these conditions, except after childbirth or an abortion? Why may they not then be due to laceration? I will, no doubt, be reminded of certain cases of supposed elongation of the cervix found in unmarried women, but I deny that such a lesion exists, as will be shown hereafter.

From my standpoint, therefore, I can but denounce an amputation, with scissors, knife, or cautery, of a so-called hypertrophy or an elongation of the cervix as malpractice. I also deprecate, as even more uncalled for, the application of the cautery or caustics to heal a so-called ulceration on surfaces which can be readily united and brought into a healthy condition. Nothing is proved by the statement that a certain number of women have recovered their health after the cervix, or a portion of it, has been removed, for I have seen many after my own work in this line do so. A man may doubtless enjoy good health after the head of the penis has been removed, even if it were done with the cautery, yet, if the operation is unnecessary, it would be malpractice to perform it. The rule, however, is not for permanent benefit to result, for no woman can remain in continued good health so long as an extent of cicatricial tissue exists in the vagina, for both her nervous system and her nutrition will suffer from it. Amputation of the cervix, or the repeated application to it of cautery or caustics, will maim any woman, and most likely render her sterile; and for the want of the support which the cervix normally affords, she will be liable to suffer from displacement of the uterus. If this so-called hypertrophy, or this elongated cervix, should prove to be simply a laceration, the sides of which can be brought together and united, so that the integrity of the parts will be as perfect as if the accident had never occurred, then to resort to ablation or cauterization is malpractice.

To those who are familiar with this subject it will not seem as if it had been treated of to an extent beyond its merits. Its importance cannot be exaggerated, since at least one-half of the ailments among those who have borne children are to be attributed to lacerations of the cervix.

CHAPTER XXV.

AMPUTATION OF THE CERVIX UTERI.

Never called for except for malignant disease—True elongation of the cervix does not exist—Double laceration often mistaken for elongation—What is the true condition?—Treatment by the cautery—Intra-uterine stem pessary—Mode of amputating—Cicatricial cervix.

I ENTER upon a consideration of this operation immediately after treating of laceration of the cervix, not because there is any connection between the two, but because I desire by the juxtaposition to make more emphatic my condemnation of amputation as a remedy for laceration in any of its forms.

I advance the statement, without qualification, that this operation, as at present applied, is to a greater extent a malpractice, and is attended by more evil consequences than any other procedure now resorted to in this branch of surgery. In fact, I am satisfied from experience that removal of the cervix is never called for except in some forms of malignant disease. The operation is, I grant, still held by the profession to be a legitimate one, but its supposed necessity is based upon false pathology. The commonest error of the day is a mistake in diagnosis between a laceration of the cervix and its supposed enlargement or elongation. I have not amputated a cervix in some nine years for any other condition than that of malignant disease; nor seen in the same space of time a single instance of hypertrophied or so-called elongated cervix, which was not due to laceration of the uterine os and neck. Since amputation of the cervix was for years an operation frequently performed by me for the relief of those supposed conditions which I now no longer find, but which I recognize and cure as lacerations, the inference is a natural one that formerly I was in error. I confess that this was true, and it is equally true to-day that the profession all over the world are cutting off and burning off parts of the cervix which, if otherwise properly treated, would result in restoring the uterus to its normal condition. I am not an enthusiast, I have not deceived myself, nor do I exaggerate these statements in the slightest degree. Yet their truthfulness will be questioned, I have no doubt, by two classes, equally conscientious in their position, viz., those who are too indolent to thoroughly investigate the merits of the case, and those who remain in ignorance from having already reached an age (varying with all of us) at which we cease to appreciate new ideas. But let the reader carefully study the description, already given, of lacerations of the cervix, and, in any case of doubtful diagnosis met with in practice, let him make the attempt to bring opposite surfaces of the uterine lips together, and he will be surprised at the result. Whenever he fails to demonstrate that the parts have been lacerated, it will be the exception to the rule, unless, indeed, the fault rests with himself in his want of the necessary knowledge.

It is true that occasionally, after a laceration, the parts become hardened, thickened, or elongated, and cannot always be adjusted with any degree of accuracy. Nevertheless the true condition may be recognized, and the parts properly treated until they can be brought together in a more healthy state. I grant that cases of hypertrophy of the cervix are frequently met with, and cases of apparent enlargement resulting from a reduplication of the vaginal wall covering a prolapse, but amputation is not the remedy for these. I am almost prepared to deny that such a condition as elongation of the whole cervix ever exists; it certainly is never found in a woman who has ever been impregnated. Sometimes when lateral laceration has occurred, the anterior lip becomes apparently elongated, and even this, as a rule, is a deception: the posterior flap becomes caught on the posterior vaginal wall, while the anterior one is crowded forward in the axis of the vagina. This will cause the parts to roll out more extensively, and the excess of tissue becomes crowded on to the anterior flap. When such a case is examined on the knees and elbows, the apparent enlargement disappears, and it becomes evident that the true condition is one of laceration. Since I deny that under any circumstances amputation would be justifiable, or ought ever to be employed for the relief of this condition, it will be unnecessary for me to enter into a consideration of the evil consequences attending the practice.

Among the sterile and unmarried women cases occasionally come under observation which are supposed to be instances of elongated cervix, when the disease is not in the cervix proper, and instead of there being an enlargement of this portion, actually atrophy is the rule. Some change in the character of the tissues forming the supravaginal portion of the uterus takes place, of the precise character of which I must confess my ignorance. It is to be hoped that at some early date the pathologist may be able to throw sufficient light on the subject to indicate the proper mode of treatment. In such a case the uterine body becomes elongated when the woman stands, and while the fundus remains stationary the tissues below stretch out, as if formed of soft putty, becoming elongated by their own weight. In this prolapse the uterine neck is pushed forward in the vagina, and frequently beyond the outlet, and the supra-vaginal portion of the uterus appears with a covering of the vagina, presenting the appearance of an elongated cervix. The probe may be passed in such a case five or six inches, or a large blunt sound can be introduced to the fundus, when, if the cervix be drawn down with a tenaculum, along the staff to the handle, the depth of the canal is shown to be eight or nine inches. If the finger be introduced in the rectum, the body of the uterus will be felt much attenuated, and when the cervix is drawn down to the full length of the sound, the instrument seems to have little more than a membrane covering it. If we next place such a patient on the knees and elbows for examination, the change brought about will be a remarkable one. The whole of this elongation will disappear, and the uterus will be found but two and a half inches in depth. The cervix itself, as a rule, is atrophied, as the result of the continued traction made by the vaginal tissues during the prolapse. In this position the uterus seems to shut up, falling together as would an old worn-out spy glass if held upright.

The fundus of the uterus seldom becomes involved in this prolapse, nor is traction exerted on the peritoneum at any point. The disease is evidently confined to a space of scarcely more than an inch from the vaginal junction. As the prolapse occurs the surrounding cellular, or connective, tissue is carried with it and is equally stretched. This is the explanation of the fact that the bladder and peritoneal cavity are rarely entered when a supposed elongated cervix has been amputated. The line of separation is below the vaginal junction, and the cellular tissue above, in connection with the peritoneum, is a protection, while the peritoneum itself often escapes injury in consequence of its distance.

I am inclined to believe that an error of diagnosis has been made whenever the peritoneal cavity or bladder becomes involved in the operation of amputation of the cervix. In every instance, when the accident has occurred within my knowledge, the woman had borne children, and I, therefore, drew the inference that there had been no elongation, but a double laceration of the cervix.

Of these cases of prolapse, due to this elastic condition above the natural function. I have met with two instances where permanent benefit seemed to have followed the removal of a portion of the neck. On the other hand, I have had five cases which were not benefited, but, on the contrary, made much worse. I feel, therefore, that we may question whether the advantage gained is ever more than a temporary one. It may be stated that of these cases five only remained for any length of time under observation. The others were apparently relieved, temporarily at least, but they may have passed into the hands of others. It may be claimed that my failure was due to the comparatively insignificant amount of tissue removed by me. This, however, is not the case: moreover, my views were formed from a knowledge of the results obtained by others before my first operation. In addition to these five cases of my own, I have had under my care at the Woman's Hospital fifteen or twenty cases in which the cervix had been amputated by others. In all of these the full length of what was supposed to be the cervix had been removed. In some of these cases the prolapse had been cured by the removal of a large portion of the diseased tissue, and by the subsequent contraction. But in all the uterus had become again enlarged, in all probability more so than before, and from the loss of the uterine neck it was impossible to keep the uterus from falling about the pelvis in every direction.

That under certain circumstances, as shall be shown, a partial amputation of the cervix may be performed. But I hold that the removal of any portion of the uterine neck is uncalled for, except as stated above, and for the removal of malignant disease. This has led me to consider the operation more in its relation to this lesion of the neck of the uterus, than as a special procedure in uterine surgery. Having, however, gone thus far, it would lead to confusion and some repetition hereafter to omit all reference to the modes of treatment to be resorted to in those conditions for which hitherto amputation of the cervix has been employed.

The portion removed in the usual operation, although unnecessarily large, is in itself too small and of too little weight to afford mechanical relief to the prolapse. The chief benefit, if any, derived from the operation is, I believe, due to the revulsive effect, and possibly to a [illegible] cellulitis which may be set up around the diseased portion. I would earnestly recommend that amputation be employed as a last resort, after other means have been fairly tested.

The [illegible] good results follow the frequent use of sponge tents to dilate the uterine canal. After their removal I am accustomed to inject a quantity of hot water into the uterine canal, and then to apply iodine freely.

Some means should also be employed to prevent the recurrence of the prolapse, and for keeping the parts continually in close contact for a length of time. After treating the case in the above manner the patient may be placed on the knees and elbows for the purpose of introducing a little cotton, saturated with glycerine, as a temporary means of preventing the prolapse. An inflated India-rubber disk, as described for use in lacerations of the cervix, may be temporarily employed, but not if it can be avoided, since by long use, it must necessarily dilate the vagina, and so as to add to the difficulty. A permanent pessary is best made of hard rubber, well fitted to the size of the vagina, but with less curve for the posterior cul-de-sac than would be otherwise applicable. A light cup of rubber must be used to contain the cervix, and this is to be swung at the proper point between the sides of the pessary, by a pivot on each side. The perfect fitting of this instrument will prevent any prolapse of the neck, and at the same time keep the uterus anteverted whenever the patient is on her feet.

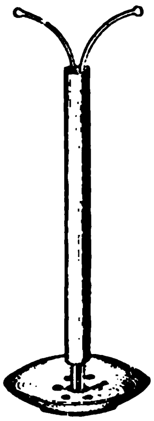
I have seen benefit, I am sure, from the application of a blister on the cervix after each period. Until this has healed, which requires some five or six days, the patient must remain in bed. She should employ the bed-pan, and not assume the upright position until the cessation of the discharge, and the pessary has been again adjusted.

The plan of employing the cautery has suggested itself, but I have never put the treatment into practice, and am quite sure my opposition is founded on correct principles, since the chief effect of the cautery is to bring about a condensation of tissue, a result which we know is very objectionable under almost all circumstances.

After the uterus has been fully dilated and shortened from placing the patient on the knees and elbows, it has occurred to me that much advantage would be derived from making four lineal applications, of a properly shaped cautery, along the sides of the canal to within a short distance of the os, from which, if the os be properly protected, no serious consequence will be likely to result. This treatment would establish a powerful revulsive effect, and act mechanically, just as it does when applied to a prolapse of the rectal tissue. The presence of these cicatrices would produce no irritation through the medium of the sympathetic, since they would not be made in pure erectile tissue, nor would contraction of the canal be likely to occur unless the os uteri had been also involved. The selection of this method would be only a choice of evils, yet it could never produce the bad consequences which frequently follow amputation with the galvanic wire or the écraseur.

Whatever information may be gained by future investigation, as to the pathological cause of this singular lesion, experience certainly teaches the necessity for correcting the prolapse, and for carefully guarding against its recurrence for an indefinite period. For this purpose, I believe that a self-retaining intra-uterine stem may prove useful. It may be formed of two portions of steel, which have been tempered, with a curve in opposite directions. The two lower ends are to be joined together below and secured by screwing into a light cap. The upper ends should be protected by a terminal bulb for each. Over the two springs should slide a cylindrical stem, which would bring the two bulbed extremities together for their introduction, but when drawn towards the cup would allow them to separate, each one to occupy a horn of the uterus (see Fig. 92). By this means the instrument would be self-retaining, and the cup attached below would prevent the prolapse of the cervix. The spring should only be of a sufficient strength to retain the instrument, but under any circumstances it would be difficult to so regulate this that it would not prove a source of irritation. In finishing the instrument, great care must be taken to round off the edges, and especially the upper part of the cylinder. The stem portion should be made a little over two inches and a half in length, if the uterus shortens to that depth when the woman is on the knees and elbows. It will be necessary to nickel-plate the steel portions of the instrument to protect them from the action of the secretions. I have for some time determined to try this plan of treatment on the first case coming under my observation, but it has so happened I have not met with a well-marked instance in several years. The presence of a foreign body in the canal may of itself prove of service in bringing about an alterative action, and the danger which always exists in using stem pessaries in flexures of the uterus would be absent here.

Fig. 92.



Self-retaining intra-uterine stem.

Since this condition may be regarded as one of atrophy (most likely of muscular fibre), the stimulus to be derived from the use of electricity may prove serviceable in causing a development of new tissue. As a continued local stimulant, for the same purpose, the galvanic current, established by the action of the secretions on plates of zinc and copper, might be applied, as has been used in the form of an inter-uterine stem to stimulate the growth of an undeveloped uterus. The disk of this stem may be attached by pivots to the sides of the pessary in the same manner as the cup, or it may rest in it. These suggestions are made from realizing the great difficulty sometimes experienced in fitting a pessary. The vagina is often very short, without a posterior cul-de-sac, and the whole passage remains in an irritable condition. But whenever a pessary can be adjusted, it then becomes an easy matter to attach the cup, and thus prevent the prolapse of the cervix for an indefinite period.

After every reasonable procedure has been resorted to, and without benefit, a portion of the cervix may then be removed as a last resort, and as an experiment. Let the operation be done with scissors and in the manner to be hereafter described, but never with the galvanic wire or the écraseur. I most strenuously object to these instruments on account of the cicatricial tissue resulting from their use, and in consequence of the certainty of partial or complete obstruction to the outlet, from subsequent contraction. Neither of these instruments divides the tissues directly across, they both draw out the mucous membrane and submucous tissue at some depth from the uterine canal. The subsequent effect is in some degree similar to Huguier's operation in which the tissues are excavated or removed in a cone shape—a most reliable procedure for obliterating in time even the semblance of an os.

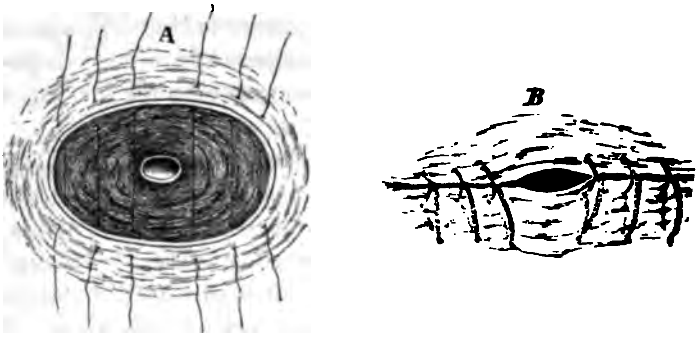
For instance, after the cervix has been removed in the usual manner for hypertrophy or induration, and left to heal by granulation, a very remarkable improvement at first takes place, unless an attack of cellulitis should have been excited. The uterus rapidly decreases in size, the tissues become as soft as in a healthy state, and this improvement will last sometimes for one or two years. But gradually the cicatricial tissue contracts and becomes more dense, until at length this condition exercises a most deleterious influence on nutrition through reflex agencies. The uterus begins to increase in size, and finally becomes even larger than before. Either the mouth of the uterine canal contracts, partially, so as to cause great menstrual disturbance, or the flow becomes retained. There are members of the profession, for whose opinion I have the highest respect, ready on all occasions to deny that these results are common, or are even to be met with. But I know of no one who has had better opportunity than myself for keeping these cases under observation. I have had some of these women, who have been operated on, to visit me at a regular interval for years, that I might study these changes.

From observation, I do not hesitate to affirm that it is only as a exception to the rule that these evil consequences do not follow e amputation of the entire cervix, and especially so whenever the face has been left to heal by granulation.

Amputation of the uterine neck was an operation which had b long practised by French surgeons, but Huguier at quite a re date has brought the operation into greater prominence. The ce has been removed, according to the fancy of the operator, with knife, écraseur, or by the galvanic cautery, for supposed elongat and for the relief of procidentia. But under all circumstances stump has been usually left to heal by granulation, a process wh requires from four to six weeks.

During the autumn of 1859, Dr. Sims made a most valuable tribution to the surgery of the cervix by covering the stump vaginal tissue. In this way he obtained union by the first intent and in my estimation an incalculable benefit was secured by thus venting the formation of cicatricial tissue. In Fig. 93, *A* repres the stump from which the cervix has been amputated just at nal junction. The sutures have been introduced so as to sufficient amount of vaginal tissue along the edge, but not any portion of the cervix. When these sutures are secured, in the same figure at *B*, the vaginal tissue will be draw difficulty over the stump in a manner similar to that in whi parts are brought together in a circular amputation of the Whenever the neck has been removed with a clean cut, b or scissors, and the stump covered, there can scarcely be contraction of the uterine canal afterwards, since the tiss

Fig. 93.



Stump after amputation of the cervix. Flaps secured by sutures.

heal up to and around the edge, thus leaving the canal of the same diameter as before the operation.

It has been already stated that I do not advocate the entire removal of the cervix under any circumstances except for malignant disease. As the members of the profession become more expert in recognizing the different conditions resulting from laceration of the cervix, the operation will become confined more and more to the limit I have indicated.

We may occasionally meet an instance of a class of cases quite common some years ago, in which the cervix is found enlarged, every mucous follicle destroyed, and the tissues white and as dense as an ivory billiard-ball, owing to the long use of the nitrate of silver, or the actual cautery. These cases would be apparently legitimate ones for amputation, if the procedure should be employed for any class not malignant, and yet even with these the operation is unnecessary. I have invariably obtained in such cases every advantage, without the disadvantages, of amputation, by simply removing, in the most superficial manner, with a pair of scissors, what was the mucous and submucous tissue, and then covering the denuded surface with the vaginal tissue as practised by Dr. Sims. As we thus remove the source of irritation, which was the cicatricial or dense tissue, we will obtain as full a revulsive effect as if the entire cervix had been amputated. We, moreover, thus transplant, as it were, a new set of mucous follicles, bloodvessels, and absorbents, which will, in time, bring about a remarkable change to a healthy condition of the deeper tissues.

The lateral tension, which is exerted as soon as the sutures have been secured, will generally be sufficient to arrest any bleeding. If, however, oozing should continue, a very moderate sized compress in the vagina for a few hours will be sufficient to control it, since the tissues in contact with the freshened surface adhere very rapidly. The after-treatment is in every respect similar to that advised for the operation of uniting the lacerated portion of a cervix uteri.

CHAPTER XXVI.

CANCER OF THE UTERUS, VAGINA, RECTUM, AND EXTERNAL ORGANS OF GENERATION.

Definition—Varieties—Etiology—Rare among Negroes—More common among the richer than among the poorer classes—Tables XXXVIII. and XXXIX.—Epithelioma—Sarcoma—Corroding ulcer—Cancer of external organs of generation.

CANCER may be described as a disease of which the first manifestation is local, but which tends rapidly to involve the whole system. Its progress is marked by destruction of tissue, and death results from uræmic, or blood-poisoning, or from the effects of hemorrhage.

The beginning of this malady is yet unknown, but the probability is greatly in favor of the supposition that it is due to perverted nutrition, and is, therefore, of local origin. I am impressed with the belief that it often has a beginning in the efforts of nature to repair or remove the consequences of an injury. New growth is thus stimulated, but from some defect or loss of balance the process is not properly checked or limited. The cells so rapidly formed, as if from a want of vitality, soon undergo disintegration, and are collected together as cancer matter. So far the condition remains purely a local one. But soon, in the effort to preserve the balance between waste and repair, this material becomes absorbed. It is carried to a distance until it becomes arrested in the lymphatic glands, beyond which, if it could pass, it might be eliminated or thrown out from the system. This cancerous material, when thus arrested in the lymphatics, clogs up the channels, and so destroys the function of the gland. Here this foreign body may lie dormant for an indefinite period, but eventually it will break down. From this new point the poison is carried in different directions, and the disease becomes a constitutional one. This stage is to be recognized by "cancerous cachexia," where, coincident with loss of blood and the effects of blood-poisoning, the features become pinched, and the complexion of a peculiar sallow or straw color. Yet this does not always occur, for instances are occasionally met with where this condition does not appear even in the last stages of the disease.

Not a little confusion is to be found among writers as to the terms and description applicable to the various forms of cancer. For all practical purposes and for convenience of description a division may be made into—

Epithelial cancer.
Sarcoma.
Corroding ulcer.

Epithelial cancer is found under two forms, Epithelioma and Carcinoma. It springs from the mucous membrane on the cervix, or from the canal below the internal os.

Sarcoma originates in the connective tissue of the uterus; it has its seat generally near the fundus, and is seldom, if ever, found below the internal os.

Corroding ulcer has its beginning, so far as my observation extends, on the vaginal surface of the cervix, and while it may involve the uterus, it extends chiefly in the vagina and on the external organs of generation.

Epithelioma is also known as papilloma, and as cauliflower excrescence.

The papillæ, or villous-like projections from the epithelial surface of the mucous membrane, are formed by the expansion of the ultimate twigs and loops of the vessels and nerves.

From these papillæ springs this disease, in its first growth. They enlarge by the rapid increase in size of their bloodvessels, which become looped upon themselves. These growths continue to be covered by a thickened mucous membrane, until they begin to break down by ulceration. They are club-shaped, and as they shoot out in every direction they present in outline the appearance of a cauliflower growth. Within the meshes of this villous tissue may now be found new cells of all sizes and shapes, thus indicating, by these characteristics, their rapid growth.

Carcinoma begins essentially in the same manner on the epithelium of the uterine canal, but spreads in the opposite direction from epithelioma, or papilloma, by sinking its club-shaped roots deep into the connective tissue, which they force apart and destroy in time by pressure. Within these spaces are found small fluid accumulations, resembling pus and serum, in which are suspended broken-down epithelial and cancer cells undergoing fatty degeneration.

When these fluid accumulations greatly predominate, we have what is called medullary or soft cancer, but if scanty the tissues are then so dense that the disease is designated scirrhus.

This term I think might be dispensed with. I have never met with any such condition, and regard the term as one which was in use to disguise the want of more accurate knowledge, any indurated tissue being designated as scirrhus.

Epithelioma and carcinoma may coexist, and run their course separately, but this is exceedingly rare. For although the growth may seem to be confined to the cervix, the tissues above will have already become infiltrated, and in turn break down, so that no line can be drawn, and none exists, between the ulcerating surfaces. These cancerous deposits always begin to soften, or break down, in their centre. As they increase in size, inflammation becomes established in the neighboring connective tissue, resulting in the formation of abscesses, which include these cancerous deposits. A number of these abscesses combine together, by destroying the intervening tissue, after which they break and discharge their contents, leaving a sloughing surface exposed. New tissue is constantly becoming involved by infiltration, so that the sloughing process extends, while from its surface, in the attempt at repair, new growth is continually springing up, to be in turn rapidly destroyed.

Generally the first symptom which will lead to an investigation will be a sudden loss of blood, caused by the first breaking down of tissue in which a bloodvessel has opened. This process is early accompanied by a watery discharge, which becomes exceedingly offensive, and afterwards assumes a greater consistency, as the tissues break down, and the cancerous matter escapes.

ETIOLOGY OF CANCER.

It has been shown by observers that the negro in this country is much less liable than the white woman to cancer of the uterus. This is unquestionably true, and I can add my professional experience in corroboration of it, since I have known but a single negro woman, and she a mulatto, who had cancer of the uterus. My own belief is that cancer of the uterus is to be found more frequently among the better classes than among the poorer ones, and that white women of this country are inflicted with this disease to a less degree than th women of older countries.

Two thousand one hundred and fifty-three women were admitted the Woman's Hospital[1] with various diseases, of which number si had cancer of the uterus, this being 2.78 per cent. on all admissions. Two thousand four hundred and forty-seven women in my private practice suffered from different sexual disorders, of which but fifty-three cases, or 2.19 per cent., were cancer of the uterus.

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[1] Twenty-second Annual Report of the Woman's Hospital of the State of York, containing Dr. John N. Beekman's report.

Within the past five or six years some restriction has been placed on the indiscriminate admission of these cases for treatment at the Woman's Hospital. This was done in consequence of inadequate accommodations, and, while the restriction may have made some difference, it could be but slight. For all cases have been received regularly when they could be placed in a general ward without annoyance to others, provided there was any reasonable hope of relief from an operation. But in my private practice there existed nothing of the kind, and I was as likely to be consulted for cancer of the uterus as for any other disorder peculiar to women. We may, therefore, accept this average as a fair one, as taken from a class who were in prosperous circumstances and native born, for the exceptions as to birth are too small in number to affect the average.

We must admit our lack of any positive knowledge in regard to the causes of cancer of the uterus. But that epithelial cancer arises frequently from perverted nutrition, in the attempt to repair injury, cannot be questioned. Those who suffer from this form of cancer about the time of a change of life are, without exception, from a class who have enjoyed more than the average degree of health. Another feature, and a most important one for our present purpose, is the fact that the average number of children borne by these women is always much above the usual one. In connection with these facts I will place on record the statement to the effect that I have never known a woman to have any form of epithelial cancer of the uterus unless she had at some time been impregnated. Moreover, I believe that nearly all if not all cases of epithelioma, or cauliflower growth, have their exciting cause or origin in a laceration of the cervix. It springs from the effort to repair a local injury, as I have previously stated, and may develop from a recent laceration, or it may occur after a change of life.

A mass of granulations may spring from the surfaces of a recent laceration, as from any other ill-conditioned sore, when due to the state of general health, or to any other cause. Upon this foundation epithelioma may become developed, from perverted nutrition, after the first child, and early in life. That such a growth would be more liable to develop in after life can be readily explained on physiological grounds. An entire change is attempted to bring about a condition in the uterus fitting it for the quiescent state in which it is to remain during the after period of life. To accomplish this the mucous follicles undergo atrophy, and the supply of blood gradually diminishes. The existence of an old cicatricial mass, such as would have been thrown out in early life between two lacerated surfaces to prevent their rolling out, will now retard the process. Frequently, such a mass will be entirely removed, as I have noticed, with great interest, and nature will even undertake, at this period of life, the same task in the vagina. But the natural change in the uterus is sometimes retarded by this extra duty, and, as a source of irritation, this leads to a fresh supply of blood being sent to the parts, now no longer prepared to receive it. The consequence is a new growth is stimulated on this epithelial surface, which has already undergone marked changes in its character. This growth may be at first benign, but becomes malignant and more extended by striking its roots deep into the uterine tissue, in quest of needed nutriment which the mucous membrane itself cannot now supply.

Fifty-one women in my practice had all borne a number of children; the other two had suffered from the effects of criminal abortion early in life, and remained sterile afterwards. Among the sixty patients treated for cancer in the Woman's Hospital there were included four cases of sarcoma. Of the total number six were unmarried (no questions were asked as to previous pregnancies), while nine were reported as sterile, but many had been impregnated. We will, therefore, exclude the sterile women, as the probabilities were all in favor of a miscarriage or criminal abortion. With the private history of two of these unmarried women I happened to be conversant, and sent them to the institution. They were about forty years of age, and had both acknowledged to me that they had been pregnant, and had submitted to a criminal abortion early in life, from the effects of which they had never recovered. The others were not in my service, and may have suffered from sarcoma.

With our present limited knowledge on this subject I should be sorry to be instrumental in establishing the rule that epithelial cancer of the uterus was proof beyond question of a former pregnancy. No rule we are told is without exception, and this may not be an exception to the rule. One fact, however, we may accept beyond question, and that is the occurrence of this form of cancer in a woman who has never been impregnated must be exceedingly rare.

This fact, together with the large average number of children borne by these women, increases the circumstantial evidence in favor of the supposition regarding the consequences of lacerations of the cervix.

Case XX.—Some seven years ago, Dr. Noeggerath, of this city, sent a case of cauliflower growth to the Woman's Hospital for operation. She called at my office for a permit, and I examined her. It so happened that I was particularly pressed for time, and in making a hasty examination I caused a most profuse hemorrhage. I made various applications without arresting the bleeding, until at length I placed her on the knees and elbows so as to be able to bring the whole growth into view, over the surface of which I placed with a spatula more than a large tablespoonful of the subsulphate of iron, or Monsel's salt, and a tampon over it. She was directed to inform the House Surgeon to remove this dressing on the next day, but she neglected to do so, and it remained in from Friday morning until the following Thursday afternoon. The Assistant Surgeon, Dr. Harrison, learning from her the nature of her malady, did not make an examination, through fear of causing hemorrhage. He simply directed his attention to her general condition until she should be seen by me in the regular routine. To my astonishment, when I removed the dressing, the mass of granulations had disappeared, showing a well-marked double laceration of the cervix. She was two or three months under preparatory treatment for the purpose of reducing the size of the uterus and for healing the torn surfaces. Afterwards the lacerated portions were united, and she was discharged with the uterus in a natural condition. I am under the impression that she visited the hospital about eighteen months after the operation, and was perfectly well. This result might have followed under ordinary circumstances even with true epithelioma; but the previous existence of the laceration is the point I wished to present.

This case first drew my attention to the probable connection between laceration and cancerous disease, and since then I have over and over again verified the existence of the injury. In fact, I have never failed to detect the laceration with the finger, unless the disease had so far advanced as to already involve the vaginal surface.

A species of non-malignant papilloma, or epithelioma, which is sometimes also termed cancroid, is found occasionally sprouting up from the lacerated surfaces of a cervix, like a mass of granulations. To the eye the appearanee is like that of cauliflower growth at an early stage of development. But the mass is softer and less friable to the touch than is true epithelioma in the condition we generally see it for the first time. The question of malignancy is only determined by the extent of its attachment, as has been already described, when it begins to sink its roots into the deeper tissues. This change may take place at any time, and the short period before it occurs constitutes the only one at which cancer in any form may be said to be local.

Table XXXVIII. gives the earliest and latest age, at time of admission, of those who had cancer of the uterus, together with the number for each period of ten years. For the private patients the average age on admission was 43.01 years; for those in the Woman's Hospital only an approximation is given in the table. For the private patients the average age at puberty was 14.43 years, being a little later in life than the general average; that of marriage was 19.41 years.

TABLE XXXVIII.—*Age at time of admission of those who suffered from Cancer of the Uterus.*

Private Hospital.	Number for each period.	Woman's Hospital.	Number for each period.
Age at admission.		Age at admission.	
27 to 30	3	23 to 30	6
30 " 40	18	30 " 40	12
40 " 50	21	40 " 50	21
50 " 60	5	50 " 60	16
60 " 64	6	60 " 67	4
Total	53	Total	59

In the *Woman's Hospital Report* the number of children is not given, and Table XXXIX. is taken from the records of the private hospital. The number of children ranges from one to ten, and there were a certain number of miscarriages. Thus there were 9 women who had 1 child each, and 7 of these women had also 1 miscarriage each; 4 had but 2 children and 1 miscarriage each; 10 had 3 children each, and 12 miscarriages in all; 2 women had each 1 miscarriage and no children; and 11 women, who had only 1 child each, had been pregnant 18 times, etc. In the aggregate, 51 women had 228 children and 44 miscarriages, making an average of 4.47 children, and 2.58 for miscarriages for each. Finally, the average number of impregnations for the 53 women was 5.16 each, which is nearly double the general average.

With these women, an average of 13.87 years had elapsed since their last pregnancy. Nineteen, or 35.84 per cent., had already gone through the change of life, at the average age of 44.95 years, the extremes being for the earliest 39, and 52 years for the latest. The average length of time since the first symptom of the disease appeared was a little over 11 months, the range being from 2 months to years. Thus there were 1 each for 8, 6, and 5 years; 3 for 3 years; 6 for 2 years; 11 for 1 year; and the remainder were below this period. The growth in 32 cases was confined to the cervix, in 3 instances to the anterior lip, and in the same number to the posterior lip; while in 26 instances both lips were involved. In 21 women the body of the uterus was the seat of the disease. In 13 cases the disease was confined to the uterine cavity, and in 8 it had also extended to the cervix. The cavity of the uterus, the cervix, and vagina were extensively involved in 5 of these cases, the bladder being perforated in 1, and the rectum in another.

TABLE XXXIX.—*Showing number of Pregnancies among 53 Women with Cancer of the Uterus (Private Hospital Report).*

	Number of children per mother.										Total.	Average.
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.		
No. of mothers	**9**	**4**	**10**	**6**	**5**	**3**	**5**	**5**	**1**	**3**	**51**	
" **children**	9	8	30	24	25	18	35	40	9	30	228	4.47
" **miscarriages**...	7	4	12	8	....	6	7	..	..	..	44	2.58
No. of women	**2**	....	....	....	....	....	..	..	..	..	**2**	
" **miscarriages**...	2	....	....	....	....	....	..	..	..	..	2	1.00
Summary:												
No. of women	**11**	**4**	**10**	**6**	**5**	**3**	**5**	**5**	**9**	**3**	**53**	
" **pregnancies** ...	18	12	42	32	25	24	42	40	9	30	274	5.16

At the Woman's Hospital, when the cases of sarcoma were included, the disease was found situated in the body of the uterus in 10 instances, confined to the cervix in 27, and both body and cervix involved in 23.

PROGNOSIS.

Unfortunately, we have as yet no means of doing more than to arrest temporarily the progress of the disease, which leads inevitably to death. A few cases are on record where the uterus, and diseased tissues about it, all sloughed away, through the efforts of nature, with recovery. This process has been accidentally established during the course of treatment, and with the same fortunate result, in several instances. Cases of cure have been also reported, as the result of [illegible] no return of the disease occurred. But [illegible] against a probability of cure, we must hold [illegible] mistakes in diagnosis. I have had two in[illegible] years had elapsed after the operation to the [illegible] them, and there had been no return of the [illegible] satisfied that I committed an error as to the [illegible] this opinion from the fact that in every [illegible] of the operation, no doubt existed as to [illegible] it has returned.

[illegible] sometimes shown in this disease is remark[illegible] under his care a lady who lived in good [illegible] years after he had detected the existence [illegible]. I have just referred to cases passing [illegible] where the disease had existed for eight, six, [illegible] years, according to the statements of the [illegible] be relied upon as to the beginning of hemor[illegible] discharge, the disease returned, on an average, [illegible] been operated on. There seems to be a [illegible] among observers as to the duration of this [illegible] been able to keep any reliable data on this [illegible] is the disease returns on an average of two [illegible] and that it runs its course in about three years.

[illegible] AND TREATMENT OF CANCER OF THE UTERUS.

[illegible] examination should be made with unusual care when [illegible] suspected to be suffering from cancer. Unless this [illegible] hemorrhage will always occur, and, since a [illegible] examination can be made under almost all circumstances [illegible] this should not be allowed to happen. It is [illegible] the back of the finger along the posterior wall [illegible] at the same time the perineum is pressed back, [illegible] air into the vagina, and of getting beyond [illegible] without touching it. If the passage be occu[illegible] or a mass be felt growing from it, the [illegible] to the surface without injury. As the [illegible] advanced in the vagina, it is able to examine [illegible] it. The examination unfortunately is

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[illegible] the Malignant Diseases of the Uterus, by For[illegible] of Obstetrics, Nov. 1870.

too often made by pushing the finger into the passage, and this always breaks through the thin covering to the bloodvessels.

If an epithelioma exists, a rough friable mass will be detected, which to the touch will resemble nothing else. Other growths resemble this in appearance, as I have pointed out, but they are soft, and none of them give the sensation as if portions of the mass could be easily broken off.

If the disease has already made any advance, we will find the organ flexed, more or less, in the pelvis, from inflammation which has been excited in the cellular tissue by cancerous infiltration. Should the ulcerative process have begun, the finger will be able to pass directly into a large cavity formed below the internal os, which has already involved the cervix. The disease necessarily confines itself to the cervix, as a rule, since mucous membrane is not found above the internal os. The lowest part of the vagina will be found filled with a thin, greasy, gruel-like fluid containing portions of broken-down tissue, the smell of which is so marked that it will never be forgotten after it has been once identified. After the diagnosis has been made as to the character of the disease, the next most important point to determine will be the extent of the malady, for on this will depend the course of treatment to be followed. If it should so happen that the disease has not yet reached the vaginal mucous membrane, but is still confined to the cervix, the case would be an excellent one for amputation. Should the vagina have become involved, the uterine cavity somewhat excavated, the organ fixed from more or less cellulitis, with enlargement of any of the lymphatic glands, to be found generally behind the uterus, and to either side of the pelvis, we can only palliate the trouble. After completing the examination the physician will urgently desire to get rid of the smell upon his hands. I know of nothing but time, literally, and a solution of thymol which will accomplish it. The solution, as made for the spray apparatus, to be used during the operation of ovariotomy, will answer, or even a stronger one might be better, and it should be kept in the office for such purposes. A solution of carbolic acid will of course neutralize that from the cancer, but, in my opinion, there is little choice as to odor between this and the cancer.

In this disease there should be no delay in operating, and the patient should always have the benefit of a doubt and be relieved of any suspicious growth. Whenever this is limited to the cervix sufficiently to warrant its removal by amputation, it should be done with the scissors or the knife. The écraseur or galvanic cautery wire should not be employed for the purpose. If we are able to get into healthy tissue by removing the neck at the vaginal junction, we should aim to leave the parts in as healthy a condition as possible. This is not to be accomplished by allowing the surface to heal by granulation. I have already pointed out the consequences of reflex irritation excited by a cicatricial mass being formed on erectile tissue. Tissue of this character is of so low a grade of vitality that it would be likely to offer a better starting-point for a recurrence of the disease than would be found in more highly organized structure. It is, therefore, good practice to make a clean amputation when we can do so, and to cover the stump by sliding the vaginal tissue over it, and securing the edges of the flaps with sutures. This procedure has been fully described under the head of amputation of the cervix, and the full details of after-treatment will be found in the same connection.

Should the disease have advanced already so far that the woman may be judged to have comparatively no future, then the more thoroughly the diseased tissues can be destroyed by the use of the cautery the better, for we thus employ the best means at command to prolong life.

The patient is to be placed on the left side, as for any examination, and the largest sized Sims's speculum is to be used. I first remove rapidly, with the scissors, as much of the growth as I can, and then employ either Thomas's wire scraper, or Simon's curette, or scoop. Dr. Sims's scraper has too sharp a cutting edge, and causes much bleeding. With some one of these instruments, all of this diseased tissue must be scraped away until apparently healthy tissue has been reached. The loss of blood is often very great, but it can be held in check by the assistant making pressure with a sponge probang against the bleeding vessel. Or several long artery forceps may be used to secure temporarily the mouths of the larger vessels. Even at the expense of considerable bleeding this work must be thoroughly done, for a partial removal would only be a fresh stimulus for a new growth. In fact, unless the operation be thorough, we will have been the means of shortening the life of the patient. After all the diseased portion has been removed, the cautery must be applied over the whole raw surface. The actual cautery is not efficacious, as there are no means of keeping up the white heat, and I have thought that the tissues contracted more and became more dense after its use than after any other application. The galvanic cautery is better, but the same objection, in a degree, exists in regard to keeping up the temperature.

The best thermo-cautery for the purpose which I have ever employed is Paquelin's instrument, as made by Charrière in Paris. Here the platina cone extremity is easily kept at white heat by forcing atmospheric air into the midst of a flame of benzine vapor, and the white heat is maintained with but little impairment even in the midst of profuse bleeding.

After this operation, the whole surface must be covered by a thick pad well saturated with glycerine, and a moderate sized tampon placed over all, even if there is no indication of bleeding. The necessity for this every one will learn by experience, and I would urge its importance in every case. The patient must be placed in bed, and not disturbed until the second day, when the tampon should be removed, but not the pad which was placed in contact with the raw surface. This must be left until detached by suppuration, for if removed by force, violent hemorrhage would result. About an ounce of glycerine thrown in with a glass syringe, along the sides of the vagina, when the cotton sticks to the edge of the denuded surface, will aid in loosening it. Five or six hours after applying the glycerine, a vaginal injection of warm water will generally be sufficient to loosen this mass of cotton so that it can be taken away without difficulty. As soon as suppuration begins, which will be indicated by the increased discharge, the injections are to be employed several times a day until it ceases. More will depend upon the proper use of these injections than upon anything else. If the fetid discharge can be checked by keeping the vagina clean, and a healthy granulating surface established on the stump, there will be a great improvement in the appetite and appearance of the patient. In fact, after such an operation, it is sometimes difficult to divest one's self of the impression that the patient has not been entirely restored to health.

It is remarkable, both as to the extent of tissue which can be sometimes removed in these cases, and as to the degree of tolerance that the system evinces to such a procedure.

CASE XXI.—Some years ago, Dr. Wm. H. Van Buren, of this city, saw a case from Baltimore, in consultation with me, and was present at the operation. This lady was about sixty years of age, and had had several hemorrhages from the vagina, before consulting me.

The finger passed into a short vagina, about two inches deep, at the bottom of which was felt a mass of cauliflower growth, involving the neck to the vaginal junction, where the passage terminated in the absence of a posterior cul-de-sac. By the introduction of the finger into the rectum a body was felt as if it were the retroverted uterus somewhat larger than would have been expected at her time of life, but I committed a great oversight in not completing my examination by a conjoined manipulation. In this mass on the cervix I detected a small opening which was apparently the os, but the probe was not introduced through fear of exciting bleeding, and from the fact that I felt thoroughly satisfied with my investigation of the case.

I anticipated no difficulty at the operation, intending to cut off only what I could of the cervix as a palliative procedure, and then cover the stump. As soon as I cut into the supposed neck I found that I had made a mistake in diagnosis, and that I was short-handed for the kind of operation before me. The bleeding was excessive from the beginning; there was no alternative but to continue to remove the growth, until I should reach comparatively healthy tissue. Before this was done the vagina and uterus had opened out into one immense cavity which was like a flaccid bag. I was unable to recognize any part of the cervix, but I began to remove the growth which had been mistaken for the uterus, and which was adherent to the vaginal walls, and filled the posterior cul-de-sac.

This I followed around and into the uterus, until there remained of the organ nothing more than the thinnest shell. I used scissors, the curette, and finally the handle of one blade of a pair of long scissors, which could be disjointed, and it proved an admirable instrument for the purpose. The loss of blood was fearful; it was sponged away by the assistant as rapidly as possible, but the quantity was so great as to run from the table upon the floor. Her life was in jeopardy, and I felt that there could not be more than a temporary security in a tampon on such a surface.

From a short distance within the mouth of the vagina I began with a needle, having a long silk loop attached, to go around this cavity in the axis of the vagina, and back to the opposite side, taking up what tissue I could at about the distance of every inch. I introduced six or seven of these running strings, radiating like the sticks of a fan, a long silver wire being attached to each, and drawn through. The two ends of the suture nearest to the bladder were first seized in one hand and held, making traction as the tissues were being slid together by the finger of the other hand. As soon as the parts were drawn up tight together in this manner, the ends of the sutures were twisted, bent flat, and cut off short. One after the other was thus secured from above downward, so that the blood was all driven out, and there could be no accumulation. The hemorrhage was thus arrested permanently by having each portion of raw surface folded in close contact with some other part. The result was that the uterus and vagina were all drawn up into a solid ball, in which, to my surprise, union took place throughout by the first intention. I could only find afterwards two or three of the shorter sutures, and the patient carried the remainder to her grave. She lived scarcely two years after the operation, and died from a return of the disease in the neighborhood of the bottom of Douglas's cul-de-sac, extending thence into the rectum. Her life was prolonged by the operation and saved by this method of bringing the surfaces together. She would have died of hemorrhage if the attempt had been made to control it by a tampon, for bleeding would have come on each time it was removed.

The frequent use of vaginal injections will greatly lessen the odor, but cannot remove it entirely. The smell of the carbolic acid is almost as disagreeable as that from the cancer, yet it is invaluable as a disinfectant, and should be added to each injection. In the use of a solution of thymol for injections in cancer, I have had an experience limited to a single case only, and I know of no one else who has employed it for the same purpose. It will prove, I am fully satisfied, a most valuable agent for correcting the smell of cancer, while it is a perfectly safe remedy and unirritating. The proper strength has not yet been determined, but it will be needed, I think, in a more concentrated form than the formula given to be used in the spray apparatus. I have directed a few ounces of this strength only, to be thrown into the vagina after each injection, and the effect has been marked. A solution of the permanganate of potash is a good deodorizer, but it is liable to undergo chemical change, and should be freshly made, otherwise it may be very irritating.

To check any unexpected bleeding which may come on, I direct that a saturated solution of alum shall be kept by the patient to be injected at any time. An ounce or two thrown into the vagina while the patient is on the knees and chest will prove very effectual. Whenever the woman is strong enough to remain for a few moments in this position, it will be better for her, as the alum is thus kept longer in contact with the bleeding surface. Afterwards she must lie quiet on the side for a while.

Whenever an injection is administered with the patient lying on the back, the nozzle must be introduced with as much care as is the finger for making an examination. And until the passage has become distended with the water it should be injected without force, through fear of causing hemorrhage. Sometimes a piece of rubber tubing drawn over the nozzle and made to project an inch beyond, with a few holes on the sides, will be a great protection. The temperature of the water used for these injections should always be elevated, unless there should exist some reason to the contrary. For the high temperature will be particularly serviceable in checking bleeding, and in lessening the supply of blood circulating in the parts.

The thorough application of Churchill's tincture of iodine, to the entire surface of the cancerous mass, is frequently very useful in arresting hemorrhage, and seems to have the effect of temporarily checking the extension of the disease.

Sometimes one of the earliest symptoms of cancer will be present in the form of pain about the pelvis, but, as a rule, it is only when the disease has advanced that the patient begins really to suffer. It is incumbent on the physician to use his best judgment in the administration of anodynes in such a disease as this, and the patient should not be allowed to suffer through the fear of becoming dependent on them. They must be allowed, and as the disease advances the patient must receive relief regardless of the quantity. A great deal may be accomplished if the selection of the agent and dose be so regulated as to gain the needed effect without disturbing the stomach or appetite. The skill of the physician will be tested in accomplishing at first all that may be required by some of the milder remedies, changing from one to the other at the proper time. Chloral will agree with a large number of persons, and answer every purpose better than any other remedy, and this is about the only disease in which I ever employed it without the fear of serious consequences. Towards the close of the disease, morphine by injection under the skin, and by suppositories in the rectum, will have to be freely employed.

I have frequently administered iodoform with most excellent effect, but in some instances there has not been the slightest benefit, so that I have long since regarded the remedy as an uncertain one. In the paper which has been referred to, Dr. Barker recommends highly the use of both chloral and iodoform. The latter remedy he employs in the form of a vaginal suppository containing ten grains. During the discussion of Dr. Barker's paper before the Academy of Medicine where it was read, Dr. Peaslee recommended the use of iodoform in an ointment of the strength of one drachm to an ounce of lard. This is applied freely to the ulcerated surfaces "with the effect of relieving pain, correcting the fetor, and notably diminishing the diseased mass."

For constitutional treatment I know of no reliable means which will exert any direct local effect. Dr. Barker urged the use of arsenic in the form of small doses of Fowler's solution for its constitutional effect. This agent has often a tonic effect by improving general nutrition, but I have never recognized any local change which could be attributed to its use.

Dr. Barker, in the same paper, details the history of a case where, after he had applied the acid nitrate of mercury to the uterine cavity, which had been extensively excavated by cancer, a prolonged salivation was produced, and extensive sloughing. The result was final recovery of the patient, after the uterus and the surrounding diseased tissue had become destroyed. In a foot-note to the same article, as published in the Obstetrical Journal, is given the history of a similar result following the use of the acid nitrate of mercury, in the practice of Dr. Mettauer, of Virginia, taken from the Boston Medical and Surgical Journal of March 10, 1870. Dr. Mettauer's patient was a negress who was married, but, as stated, had never conceived.

Dr. Routh, of London, reported[1] in 1866 two cases of cancer cured by the use of an alcoholic solution of bromine. As this agent has not come more into use, the supposition is that it exerts but a temporary effect in arresting the progress of the disease. However, if the acid nitrate of mercury can destroy the uterus, and save a life occasionally by "eating" out the entire cancerous mass, bromine, as an equally active agent, is far better adapted for the purpose. To apply bromine to a comparatively healthy uterus, or to one in any other than a cancerous condition, should never be thought of. Apart from the destruction of tissue there is great danger from cellulitis or peritonitis. But in cancer this danger would be slight, since, from an early stage in the progress of the disease, nature attempts to protect herself by throwing out the products of inflammation in advance. If, therefore, any agent can be made useful for destroying the uterus and surrounding diseased tissue, bromine is the best, since a peculiarity of its action is in its greater effect upon diseased tissue than upon that which is healthy.

SARCOMA OF THE UTERUS.

This disease may present itself at any time during the menstrual life. It originates in the connective tissue of the uterus, generally near the fundus, and is of slow growth. It is of rare occurrence, and is frequently mistaken for carcinoma or epithelioma. I have seen but seven cases, all, with one exception, occurring among women who had never borne children; and in five the disease developed in connection with supposed fibrous growths. All of these women had been under my care, and I had detected the existence of the fibrous growths long previous to the appearance of the sarcoma. Schroeder[2] describes a distinct pedunculated form of sarcoma with a narrow pedicle. The cases I have seen were but outgrowths from the uterine surface, with the base as broad as any other portion. I therefore doubt this as a distinct form, but regard it rather as additional proof of the development from fibrous growths. The explanation of these cases presented by Schroeder is most likely, that the sarcoma developed in the polypus after the tumor had become pedunculated. The uterus will frequently detach and drive out the growth when it has increased in size sufficiently to excite it to contraction, and this occurrence is generally mistaken for a miscarriage. But it is scarcely possible that a growth of the consistency of sarcoma could ever be forced by the action of the uterus into a pedunculated form, with so slight an attachment as Schroeder describes.

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[1] A New Mode of Treating Epithelial Cancer of the Cervix Uteri and its Cavity, by C. H. F. Routh, M.D., etc.—Transactions of the Obstetrical Society of London, vol. viii.

[2] Ziemssen's Cyclopædia, American edition, vol. x.

Sarcoma develops much slower than, but is as fatal as, any other form of cancer. Our knowledge of the disease is yet too limited, and too small a number of cases have been put on record, to furnish us with accurate information as to its laws of early development and after growth.

Diagnosis.—The earliest symptoms of sarcoma will be a watery discharge, then a frequent show, out of time, and free menstruation. The discharge has been compared to water filled with meat washings, and is not always offensive as with other forms of cancer equally far advanced. As a rule, there will be but little pain, except sometimes in the back, as might accompany any uterine difficulty. The cancerous cachexia and symptoms of blood poisoning come on at the last stages of the disease. A vaginal examination will only establish an enlargement of the uterus, with no indication of disease about the cervix. Until the uterus has been dilated sufficiently for the introduction of the finger, we cannot form a diagnosis, for every symptom may be due to a uterine polypus undergoing disintegration.

When the finger can reach the fundus, nothing may be detected but a small soft mass of granulations, not unlike epithelioma in its early stages, but of different density. In the recent development of the disease this growth may be mistaken for the granulations which are frequently found in women who have had a number of children. The microscope may establish the diagnosis by detecting the presence of what are termed the spindle-shaped cells of sarcoma, each containing one or more large oval nuclei. The same general rules are applicable for the treatment of sarcoma that have been already given in full for other forms of cancer.

Certain points in diagnosis, and regarding the general history, have not yet been fully given, being withheld to be presented in connection with the following cases.

Case XXII.—Mrs. H. B. S., aged 29, sterile, was admitted to my private hospital July 28, 1863. She menstruated first at the age of 16 years, and was never regular afterwards. Previous to her marriage, at 19, she had menstruated but three times. Shortly after marriage she began to suffer from hemorrhages at irregular periods.

I found the uterus enlarged from a fibroid in the anterior wall, but as this growth was too small to account for the size of the uterus, I dilated the canal with a sponge tent a few days after her admission. I found a fibrous polypus about an inch and a half in diameter, attached by a short pedicle to the fundus, and I removed it without difficulty. For two years she menstruated naturally as to quantity. By degrees this became more free, until at length, in the summer of 1867, while at Beaufort, South Carolina, where her husband was stationed, she consulted Dr. Stewart, who removed a second tumor which was soft and filled the cavity.

Dec. 21, 1867, she was admitted to the Woman's Hospital. I found a soft growth as large as a hen's egg springing from nearly the whole anterior wall, and filling the canal. Dr. Clymer, who was then connected with the institution, made a microscopic examination, and pronounced it a recurrent fibroid.

23*d.* I removed the whole mass in a most thorough manner down to apparently healthy tissue, by means of scissors and a scoop. Then Churchill's iodine was freely applied throughout the whole canal, with the effect of causing the uterus to become greatly reduced in size. She recovered from the effects of the ether readily, and there occurred nothing special to mark her case.

26*th.* Vaginal injections were used several times a day and continued from the first discharge after the operation. She made a good recovery, and went home Jan. 11, 1868.

I was informed afterwards that the growth soon returned, as was made evident by the recurrence of the hemorrhages, and she died Oct. 13, 1868.

If we can ever be certain of the existence of a fibroid in the uterine walls, I was as to this tumor, which I detected between three and four years before Dr. Stewart's operation for the removal of the sarcoma from the site of the fibroid.

Case XXIII.—Mrs. E. D., aged 35, was admitted to the Woman's Hospital Oct. 15, 1867. Menstruated first at 15, was generally regular in both time and quantity until the commencement of her present difficulty. Married at 23; had had one child and five miscarriages. Four years and a half previous to admission she began to suffer excruciating pain during the menstrual period, and at the same time from menorrhagia. She received no treatment, but on the 25th of September, 1866, something seemed to burst from her, and a large mass came away per vaginam. On examination this was pronounced a hard fibroid, which had become enucleated spontaneously. For three months afterwards, she was perfectly well, but she then began to flow again.

July 19, 1867. Drs. Peaslee and Sabine removed another growth from the uterine cavity, which was supposed, at the time, to be an ordinary fibrous polypus. There was but little improvement after the last operation.

Oct. 21. I dilated fully the uterine canal, and found a soft mass springing from the fundus by a broad base. The patient was placed under the influence of ether, and I removed the entire growth with but little bleeding.

A portion of this tumor was examined by Dr. Francis Delafield, who stated that "the tumor clearly belonged to the class of tumors described by Virchow under the name of medullary sarcoma." (Such tumors growing from the mucous membrane of the uterus have been observed at times, but are not common. The prognosis of such a tumor is bad, less so on account of secondary growth in other organs, than on account of its certain local recurrence and the consequent general exhaustion of the patient.)

Nov. 8. The condition of the patient had improved sufficiently for her to return home. The record of her case gives no further history, as she probably never returned to the hospital. My impression is that she died shortly after her return home.

CASE XXIV.—In June, 1874, I was sent for to remove a uterine tumor from a woman residing in Stockholm, N. J., and was accompanied by Drs. Bache Emmet and Alfred E. M. Purdy to assist me. I had taken it for granted that I would find the uterus dilated for the operation, but this had been neglected. The distance was too great for me to return, and it was necessary to do something speedily to check the loss of blood to which she was liable. I had her placed under ether, and on the back; then, while steadying the fundus of the uterus with one hand over the abdomen, I commenced rapid dilatation by means of my index finger. This was the first time I ever attempted it, but I soon succeeded in working the finger up to the fundus. I then felt a soft mass of granulations, not larger than the end of my finger, and not pedunculated. These were easily removed with the finger-nail and with a pair of forceps I have for the purpose of taking away other granulations from the uterine cavity. The case then seemed of little importance; but she again had hemorrhages during the summer, and was admitted in consequence to the Woman's Hospital October 15, 1874, with the following history:—

Her age at that time was 42. She had menstruated for the first time at the age of 18, and had been regular afterwards. She had married, and was sterile. Her health had been good until four years previous to her admission, when she began to flow, and then had a continuous show for twenty-three weeks. Her appearance had greatly changed since I had seen her in June. She was now sallow and cachectic; had had several chills within a few weeks before entering the hospital; and was then too weak to sit up all day.

The uterus was dilated: she was seen by Dr. Sims in consultation, and an operation was decided on. Ether was administered, and, without further delay, I removed with forceps, and afterwards the curette, a soft mass, as large as an English walnut, from the same point of the fundus from which I had before taken it away. The bleeding was very profuse, but it was arrested promptly by throwing hot water into the uterus and by freely applying iodine afterwards. Until October 30 an elastic catheter, attached to a syringe, was passed to the fundus daily, and the cavity thoroughly washed out with warm water and a little carbolic acid. As the discharge was rather more profuse than is usual two weeks after such an operation, iodine was freely applied to the fundus by means of the applicator, and some cotton.

Nov. 1. At 2 A.M., just twelve hours after this application, she was seized with a severe chill and died at 8 A.M.

The post-mortem examination was made about seven hours after death. The beginning of a local peritonitis was evident from the agglutination of the intestines about the uterus. When these were separated, which was easily done, it was shown that a portion of the fundus had begun to slough, and around this was a well-marked line of demarcation. Although soft, this plug was lifted out, by a little traction, from the uterine wall, leaving an opening about an inch in diameter. The inner face of the plug was the limit of the base from which the tumor had been removed. A low grade of inflammation was no doubt established by the operation, which involved the remaining thickness of the uterine wall, and in a few days an opening would have existed. Either some fluid did escape into the peritoneal cavity, or the softening process excited the local inflammation in the peritoneum. She was, however, rapidly dying from blood poisoning, so that it would have required but a slight shock, at any time, to have caused death.

Corroding Ulcer.—An ulcerative process attended with great destruction of tissue, which is supposed to originate on the cervix. It may extend within the cavity, but is usually confined to the walls of the vagina, through which it often penetrates into either the bladder or rectum. It may sometimes, in the same subject, open into both cavities, for such cases have been recorded, but I have never known of an instance. This form of cancer is almost as rarely met with as true sarcoma. We know nothing of its early stage, since it is always far advanced before any suspicion arises of its existence. The disease seems to be confined to those who have been frequently pregnant, and arises about the time of the final cessation of menstruation.

Hemorrhage is one of the first symptoms, and its significance may for a time be overlooked by attributing its occurrence to a change of life. There is frequently no pain, and consequently medical advice may not be sought until the coming on of the thin and offensive vaginal discharge, which always accompanies cancerous ulceration in every form. As the disease advances, the effects are very similar to those of cancer generally in the cachectic condition: there is increase of pain, loss of flesh and appetite, with dyspepsia and constipation, and death, at last, from exhaustion, or from the shock attending some sudden attack of peritonitis. Yet, among those suffering from corroding ulcer, there will be many more exceptions to every rule than there are among those with any other form of cancer of the uterus. I have seen two or three instances where no pain was experienced from the beginning to the end, and when the patients died from sudden attacks of inflammation, brought on by the spread of the disease, they seemed to be in perfect health. After they had learned to keep themselves clean, and to check any sudden bleeding, they were able to get as much enjoyment out of life as the average number of women in good health. I think, as a rule, women suffer less pain, and that the progress of the disease is much slower, with corroding ulcer than with cancer proper.

CASE XXV.—I was consulted several years ago by a lady 71 years of age, who was then in good health for one at her time of life, and yet she had had this disease for probably twenty years. This I judged had been the case from the symptoms which were presented, while already nine years had elapsed since the labia had been destroyed by the advance of the disease from the vagina. In her case there had been no loss of blood for many years, so long in fact that she could give no approximation as to the time. I found on making a vaginal examination that every thing seemed to have been destroyed but the bladder and urethra, and yet she understood so well how to take care of herself, that no one would have had the slightest suspicion of her condition. Her position in society was well known to me, and I have not the slightest doubt as to the accuracy of her statements. She lived for some eighteen months after I saw her, but I was never able to ascertain the immediate cause of her death.

Diagnosis and Treatment.—There would be but little difficulty, from the history of any case, to ascertain that malignant disease existed, but without an examination it would not be easy to determine the form. We will find the same offensive sero-pus-like discharge. With the finger the outline of the ulceration can be distinctly traced, since (and it is a peculiarity of all cancerous ulcerations) the surface breaks down, and is always below the level of the surrounding healthy tissue. On the introduction of the speculum, the ulceration will appear as a roughened surface of a dirty grayish-brown color, surrounded by a perfect line of demarcation. The ulcerated surfaces terminate by a narrow but marked red line directly in contact with perfectly healthy tissue. In this disease we never find cancerous infiltration in the neighboring tissues; the uterus is generally of a natural size and perfectly movable, except as in last stages of the disease, a recent attack of inflammation may have been established.

I have nothing to add to the general plan of treatment already given, there being the same necessity for the most perfect cleanliness, to keep up the general health, and, when necessary, to relieve the suffering of the patient by the judicious use of anodynes. If the disease be seen at a comparatively early stage, I would recommend the most thorough application of the cautery. There exists but little hope of eradicating it, but we are often able to delay its progress by this means.

Cancer of the External Organs of Generation.—But little in addition need be stated in relation to cancer of the external organs of generation. It is sometimes limited to the clitoris, but, as a rule, the disease is in the form of the corroding ulcer extending from the vagina. This form of cancer has been termed rodent ulcer, and by some lupus from its resemblance to lupus in other parts of the body. But I regard all forms of cancer found at the outlet of the vagina as corroding ulcer or epithelioma, modified somewhat by the difference of tissue.

Any suspected growth on the labia should be extirpated without delay, while the parts are yet movable. The edges of the wound must be brought together and secured by silver sutures. This will check any amount of bleeding not excessive, and leave but a cicatricial line after the process of healing has terminated. But if bleeding should recur, it can be arrested promptly by placing a rolled compress, the size of the finger, on each side of the suture and securing these by a T bandage.

Cancer of the Rectum.—I do not intend to treat of cancer of the rectum, since it is not strictly within the scope of this work, but I wish to place on record the description and after history of an operation which is of interest in connection with this subject.

CASE XXVI.—Mrs. M. D., aged 35, was admitted to the Woman's Hospital April 1, 1871. She had borne seven children, and had one miscarriage; the last pregnancy was four years previous to admission. Her labors had all been difficult, and with her miscarriage she had a great loss of blood, and suffered from pain afterwards; was confined to her bed for seven weeks. After this miscarriage she never regained her health, but had a great deal of backache, pressure on the bowel, pain down the right leg, with prolapse of the anus for a year afterwards.

At the time of her admission the period was regular, but frequently lasted two weeks. Her chief complaint was a feeling of an uneasy sensation in the lower part of the back near the anus, which was accompanied by a frequent desire, sometimes as often as five or six times daily, to evacuate the bowels. This feeling had existed about two years prior to admission. But from the previous Christmas she had been subjected to pain of a sharp lancinating character, which was not continuous. Her suffering had become so great within a short time that she was unable to sleep or do anything without being all the time under the influence of opium. This had already affected her general health, for she had become pale, and had lost both flesh and strength, so that she spent the greater portion of her time in bed.

At length she consulted Dr. Sims, who discovered a hard circumscribed mass the size of a hen's egg, occupying the posterior wall of the rectum an inch above the sphincter, very painful to the touch. There was no discharge from this mass in the bowels at the time of the examination. Dr. Sims removed a portion, and as the microscope showed it to be epithelial cancer, he advised her to enter the Woman's Hospital, then in my charge.

I found the mass as described above, and I could distinctly trace it out to its limits, but below, just within the sphincter, and surrounding the gut, so as to include about an inch of the recto-vaginal septum, the tissues felt as if infiltrated with serum. The muscle itself was more rigid than usual, and the examination gave her a great deal of pain. The mass was evidently increasing in size, very sensitive when touched, and filled up the passage to such an extent as to seriously obstruct the canal. No enlargement of the glands could be detected, and I decided to remove the mass.

April 17. Operation. Present, Drs. Sims, Wm. H. Van Buren, James R. Wood, and others. After the patient had been etherized, the sphincter ani muscle was fully dilated by stretching, so as to enable me to get at the mass with greater facility. It was then drawn down by means of a double tenaculum, and held by an assistant. A steel grooved director, as the most convenient instrument for the purpose, was pushed through the skin in front of the coccyx and just behind the outer edge of the sphincter, into the cellular tissue of the pelvis, and then made to puncture the rectum, in healthy tissue, just beyond the upper edge of the tumor. The end was turned out of the gut and pushed far enough forward to rest on the perineum while the other end was over the coccyx. Then a second director was passed around from the outer side of the muscle on one side, through the cellular tissue into the rectum, across to the other side, through the cellular tissue and skin again to the opposite side of the muscle. So that the mass, with a portion of the rectum above, was now brought through the anus and fixed by the two directors, which had been passed behind the mass at right angles to each other, with their ends resting outside on the soft parts. The chain of an écraseur was placed behind these two instruments and slowly tightened until the whole mass, as transfixed, was cut through along the course of the directors. By this means I removed the entire sphincter muscle, about three inches of the posterior wall of the rectum, and about an inch and a half of the rectal surface of the recto-vaginal septum. The immediate result was a most formidable opening in the connective tissue of the pelvis, about three inches in diameter, and cone-shaped from below. There was not the slightest bleeding at first, but I detected a hard mass a little to one side, as if it were a lymphatic gland, which I snipped off with a pair of scissors. I at once realized my mistake, for I had opened a vessel of large size, and as it retracted deeper into the cellular tissue I could not secure it by a ligature. I placed over the surface a thick compress of cotton, which had been wet with alum but squeezed dry, and then introduced over this a vaginal glass plug fully two inches and a half in diameter. Finding that this arrested the bleeding, it was covered in front by a compress of a towel rolled up, and a T-bandage over all.

For several days following, there was very marked febrile reaction, with excruciating pain from the continued pressure of the glass plug, so that it was necessary to keep her all the time fully under the influence of opium. As the catheter could be introduced by slightly depressing the edge of the plug, this instrument was not disturbed until April 20, when suppuration having begun, the plug and cotton tampon could be removed with safety. This was followed by a profuse brown discharge without odor. The passage was then syringed out gently with a weak solution of carbolic acid and warm water, to the great relief of the patient. That afternoon the bowels were moved naturally, she was conscious of the passage but had no power of control. No further treatment was needed, except the administration of an injection several times a day.

April 23, the bowels were moved again, but with considerable pain. April 29, the bowels continued to act regularly, though when moved she suffered pain, and had a free brownish discharge afterwards. The use of opium had been steadily diminished from excessive doses to ♏ xx. of Magendie's solution daily; she now began to sit up. May 15, the wound had almost entirely healed, the patient walking out, feeling well, with improving retentive power, but still some slight pain after every movement of the bowels. Discharged June 5, surfaces all healed, with good retentive power, and the parts free from induration. As the healing process advanced and the surfaces contracted, the healthy gut above was drawn down, and brought nearly in contact with the external parts. She promised to return in a few weeks, as I feared the entrance to the gut would close by contraction, when I determined to make an opening into the vagina.

She returned at the end of eighteen months to say that she was perfectly well. Six months later, she called for the same purpose, when I detected a movable mass, about half an inch in diameter, in the portion of the recto-vaginal septum which was not removed. I wished to operate at once, but it was three months before she could make up her mind, as she was feeling perfectly well. I then found it had reached to the sigmoid flexure; she was already beginning to be poisoned by the accumulation in the colon. I proposed colotomy for her relief, but she would have nothing more done, and died a few weeks afterwards.

CHAPTER XXVII.

DESCRIPTION, ETIOLOGY, AND DIAGNOSIS OF FIBROUS GROWTHS OF THE UTERUS.

Mode of formation—Etiology—Tables XL. to LII. inclusive—Diagnosis.

A FIBROUS growth has its origin within the muscular tissue of the uterus, and is generally of a dense structure, but not always, and it may or may not undergo cystic degeneration.

Such a tumor may remain as an isolated mass within the uterine tissue, being limited in growth, or it may gradually involve the greater portion of the organ, attaining an almost unlimited increase in bulk.

A fibrous tumor of the uterus has been termed a "fibro-myoma" by Virchow, a "fibroid" by Rokitansky, and "a partial hyperplasia of the uterine parenchyma" by Klebs.

While small, such a growth may be designated a fibroid; when larger, and out of the pelvis, a fibrous tumor, or a fibrous growth of the uterus, without reference to the degree of development.

As an exceptional circumstance, an accumulation of fluid sometimes occurs, within certain portions of these growths, and then they are said to have undergone cystic degeneration. But should this process become so extensive as to involve the whole mass, leaving but little of the fibrous element, it is then termed a fibro-cystic tumor.

According to Klebs,[1] "Microscopic investigations show that the chief mass of the tumor consists of smooth muscular fibres which considerably exceed in size those of the unimpregnated uterus." "The muscular fibres are arranged in bundles, and the latter unite variously at acute angles to form larger groups, which enclose a wide capillary bloodvessel. The walls of the latter consist of a simple layer of endothelium cells with large nuclei, and are supported by a thin layer of fibrous connective tissue, from which processes penetrate between individual groups of muscular bundles, and unite with coarse partition walls between the individual vascular districts. Between the muscular bundles, as well as between those and the connective tissue sheaths of the vessels, may be observed everywhere, by careful treatment, narrow slit-like gaps, which here and there contain white blood corpuscles, and are surrounded by a fine boundary line, within which, here and there, lie nuclei. A cavernous structure thus originates, which is not found in the normal uterine tissue, and it is very probable that these cavities are to be regarded as lymph spaces in which the bloodvessels and muscular bundles are suspended, as it were, by fine bands of connective tissue."

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[1] Handbuch der pathologischen Anatomie. Von Dr. E. Klebs, vierte Lieferung.

"The further increase in size of these tumors ensues rarely by the coalescence of several of them; more frequently it takes place by the same process being repeated which gave rise to the smallest and simplest fibro-myomata. Each individual vessel, with the muscular and connective tissue masses belonging to it, proliferates again and forms, as it were, a second generation of nodules, which are imbedded in the original tumor and distend the latter."

"Not rarely their disposition is such that the tumor is arranged in the form of wedge-shaped lobes around the centrally situated large vascular trunks, the broad bases of which lie on the surface. In other cases the formation of secondary nodules occurs only in particular places of the tumor, and these originate quite irregular tuberous forms. These peculiar inner processes of growth lead now to dislocations of the tumors, all of which had a common origin in the muscular tissue of the uterus. If increase in the parts adjacent to the mucous or serous membranes ensues, especially in nodules superficially situated, the latter elevate themselves above the surface and finally, sustained by the increasing weight, project entirely beyond the surface. In this way fibro-myomata originate, which either are suspended by a narrow pedicle quite beyond the uterine wall (extramural fibro-myomata), or the connection with the latter is more extensive through a looser layer of tissue pervaded by wide venous sinuses. In the latter case the dilated veins can frequently be traced through the entire thickness of the uterine wall. Further differences in the structure of these tumors are occasioned by the preponderating development of one of their histological constituents, and by degenerative processes. In regard to the first series, each tissue participating in the formation of the fibro-myoma can displace the rest. Most frequently this takes place on the part of the connective tissue, whereby the entire tumor becomes denser, firmer, more fibrous; the lymph spaces and bloodvessels within the tumor are narrowed and partly obliterated; the smooth muscular bundles are preserved, but the individual fibres can no longer be recognized separately; in their place, very narrow, long, rod-like nuclei lie embedded in a striate[illegible] basis substance. Accordingly, even in this stage of developmen[illegible] the tumor cannot at all be pronounced a pure fibroma. Its biologic[illegible] activity is herewith closed, and these are just the forms in which degenerative processes appear. A preponderating development of the muscular tissue, which would stamp the tumors as pure myomata, is rare; in general, the formation of the muscular substance runs parallel with the vascular development, and the richer nutritive supply thereby originating; yet tumors also occur which from the outset consist almost entirely of smooth muscular fibres, possess the grayish-red, dimly transparent appearance of normal uterine muscular tissue, and are evidently contractile."

"In a like hyperplastic way can the vessels of the fibro-myomata develop; the lymph spaces dilate to smooth-walled cysts, destitute of a special membrane, and filled with clear limpid fluid. The process begins in the centre of the tumor, in the immediate neighborhood of the larger vessels, and the cysts frequently exhibit narrow processes, which are prolonged into the connective tissue partition walls between the individual nodules, or there are formed here swollen cysts placed in rows. Cystic fibro-myomata of the uterus can attain very considerable size, especially when, as may frequently happen, heterologous, especially myxomatous and sarcomatous, new formations become associated with them. But also simple cysts of considerable size are known, which are surrounded on all sides by muscular substance. Their contents then are usually dark brownish-red from altered blood, the walls villous, the cavity pervaded by muscular trabeculæ. In these cases a softening of the walls appears to have introduced the enlargement of the cystic lymph spaces."

"Bloodvessels of a venous character, in a state of ectasis,[1] are very frequently found, as already mentioned above, in the vicinity of the myomata, and contribute, in the extra-mural forms, not a little to the loosening of the connection between the tumor and the uterine tissue. Here those bleedings characteristic of the sub-mucous forms most frequently originate; partial separations of the surface, thinned by the traction of the tumor, ensue, opening the vessels. In this latter case, dilatation of the bloodvessels takes place partly in a passive manner, while the development of ectases of the bloodvessels within the tissue of the tumor is of a decidedly active character, their formation being probably already laid in the origin of the tumor. Virchow discriminates this form properly as teleangiectatic[1] or cavernous myoma (myoma teleangiectases seu cavernosum). Their structure corresponds completely to that of the compound fibro-myomata, but the muscular substance preponderates, whilst the connective tissue portion diminishes. The large muscular cells arranged together in bundles, immediately touch the vascular walls, which consist of a single layer of very large and readily detached spindle-shaped endothelium cells. In those places in which this development has advanced furthest, the tissue is completely like the erectile tissue of the corpora cavernosa, only narrow partition walls separating the large blood sinuses from one another; likewise we see, on longitudinal section, smooth-walled dilated vessels which lead to the wide vascular sinuses in the periphery of the nodules of the tumors. The cavernous spaces within the nodules I might designate, on account of their structure, as ectatic capillaries. The smooth muscular fibres in these tumors possess a considerable degree of contractility; in the recently hardened preparations we see regular flexions of the bundles in the transverse direction, occasioned by the hardening process, just as occur in similarly treated smooth muscular tissue. In this way is explained the often very quickly changing fulness of the bloodvessels, and the increase in volume that has been many times observed in these tumors, reaching sometimes, according to Kiwisch, to double the size of the womb. From this must be discriminated the slower increase or diminution in size of the organ, which depends on the filling of the split-like lymph spaces, especially in the vicinity of the teleangiectatic myomata."

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[1] ἔκτασις, a stretching out.

I have quoted at length from this author, since he presents the latest authority on this subject, and I have nothing to offer of my own on the early development of these tumors.

Fibrous growths of the uterus are of themselves innoxious, but, as a rule, they cause great mechanical disturbance from bulk and weight. Therefore, hemorrhage with menstrual derangement from obstructed circulation will be one of the earliest symptoms. With increased growth there occur certain displacements of the uterus, due chiefly to retroversion and prolapse. The healthy action of the bladder and rectum becomes impaired at an early stage, as a consequence of pressure, from which great suffering is caused by irritation of the bladder, constipation of the bowels, and the formation of hemorrhoids. Moreover, if the tumor remains wedged within the pelvis, the continued pressure on the nerves and bloodvessels connected with the lower extremities leads often to great suffering and serious consequences from the obstructed circulation. Should the tumor continue to grow and occupy the abdominal cavity, death must ultimately result from exhaustion. Anæmia is early caused by the continued loss of blood, while the state of exhaustion is at length completed by the functional disturbance due to continued pressure on the stomach, lungs, heart, and kidneys.

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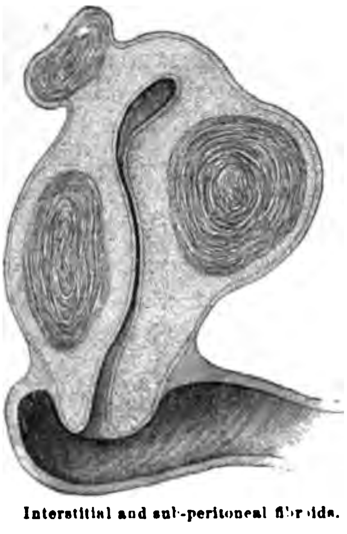
[1] τέλος ἀγγεῖον ἔκτασις, bloodvessels stretching out (expansion of terminal blood vessels).

1st. A tumor or a series of tumors may, by increasing bulk, involve the whole uterus in every direction with the consequences just described.

2d. The growth may become developed towards the outer surface of the organ, or in the direction of the uterine canal. If on the outer surface, it would be termed a sub-peritoneal fibroid. As such it may remain partially protruding from the uterine wall, or it may become entirely expelled so that its connection with the uterus would only consist of the peritoneal covering and a little connective tissue. This would form a pedunculated sub-peritoneal fibroid, with but little vitality since its source of nutrition will have been nearly cut off. It may thus remain and gradually undergo some degeneration. The weight of such a tumor as shown in Fig. 94, near the fundus, may gradually cause the connection with the uterus to be stretched out into so thin a pedicle, that the mass may become at some time separated, as the result of violence. Peritonitis and its consequences would, of course, result from the presence of the detached tumor now causing irritation like a foreign body. The mass may become encysted in the pelvis, and eventually be destroyed in an abscess from cellulitis, or it may form new attachments and receive a sufficient supply of blood to enable it to continue to grow.

Fig. 94.



Interstitial and sub-peritoneal fibroids.

A sub-mucous fibroid may gradually be forced out from the uterine tissue into the canal as has been shown to take place under the peritoneum. This is accomplished by contraction of the uterine tissue by which the tumor is driven in the direction offering the least resistance. As the growth advances into the canal, it will receive a covering of the mucous membrane over the projecting portion. When favorably situated the tumor becomes pedunculated, and is then termed a polypus.

It has been generally taught that each tumor is invested with a distinct capsule. This is a most important point, and from its bearing in practice should be definitely settled. While it is not my province to make issue with the pathologist, since I cannot substantiate my impressions from actual study of the minute tissues, my observation in many cases leads me to question the existence of such a covering. When a fibrous tumor is growing rapidly, it certainly cannot be then invested, or isolated, as it were, by a capsule. Such an arrangement could only be conceived of after a tumor had ceased to grow. As a fibrous tumor grows, it seems to incorporate the uterine tissue in advance of the actual limit of the tumor, without producing at first a marked change in structure, as a drop of water would do on a lump of sugar, permeating the mass before effecting the solution of each successive portion. Experience has taught me that a fibrous tumor, while still increasing in size, cannot be enucleated as from a capsule. It may be torn out by force from the uterine tissue, but it will be done at the expense of its integrity, since portions of the tumor will be left adherent to the uterus, and healthy uterine tissue will be found on the ragged surface of the tumor. When a fibroid has ceased to grow, and has been long subjected to compression by uterine contractions, it can be shelled out of its bed with the greatest facility, and with a smooth surface as from a capsule. But the tumor has not in reality acquired a distinct membranous investment, the enucleation being determined simply by a difference in the degree of density of tissue between the hard fibroid and the uterine structure. After macerating a hard fibroid I have succeeded in separating portions of four and five distinct investments, like the concentric layers of an onion, each layer being thinner and thinner from without inward, until the last and innermost becomes blended with the true fibrous structure. At the Woman's Hospital, I once accidentally enucleated a fibroid from its outer covering. This was afterwards separated from the uterine tissue with difficulty, and was supposed at the time to be the thick walls of a cyst.

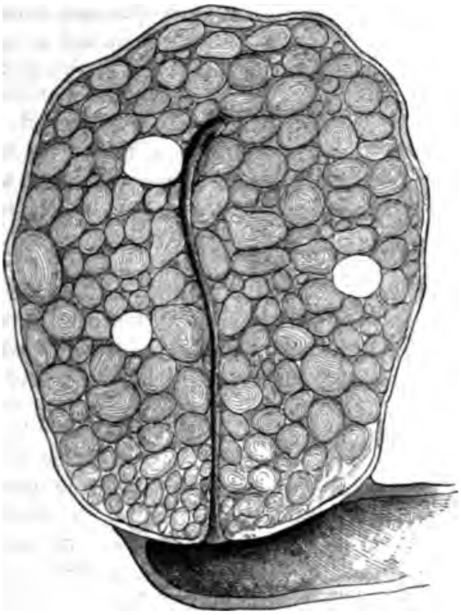
3d. If the tumor remains interstitial it will receive a much smaller supply of blood than if it were situated under the mucous membrane. It frequently then remains passive, and from being subjected to long and continued pressure by uterine contraction, it at length becom[illegible] exceedingly dense in structure, with the not uncommon result [illegible] finally undergoing calcareous degeneration. This structural chang[illegible] has been compared to a coral formation with minute interstices, as [illegible] the spongy portion of bone. It is a degeneration of the tissue proper, leaving the few bloodvessels unchanged in their course through the porous portion. These masses are sometimes expelled from the uterus, and are mentioned by the early writers who were, however, ignorant of their mode of formation. I have found this degeneration in the midst of a second growth, showing that the first had ceased and undergone this degeneration, but became afterwards involved and embedded in the advance of a second tumor which had an entirely different origin.

The uterus sometimes disintegrates, as it were, into many distinct tumors, as I have had occasion to observe. While in charge of the Woman's Hospital, some ten years ago, a woman was brought to the institution, suffering from an immense fibrous tumor, and in so exhausted a condition that in charity she was admitted. For several years she had been free from hemorrhages, and the tumor had apparently increased but little in size during the same time. But from the effects of long pressure and from the great weight of the mass she had suffered continually. For her permanent relief there was nothing to be done, since she was in too exhausted a condition to attempt the removal of the uterus, if this operation had been thought advisable. She was emaciated to a remarkable degree, so much so that the tumor really constituted the greater portion of her body. She died from exhaustion a few days after admission, every function having long been obstructed in its healthy action.

After opening the abdomen the tumor was found to be literally a conglomerated mass held together apparently by a thin capsule over all, through which the inequalities could be seen and felt, while through the abdominal wall the tumor seemed to be solid. The uterus was laid open with great difficulty and in section presented very much the appearance represented in Fig. 95. The whole uterine tissue had become converted into hundreds of fibroids of all sizes, with but little or no connective tissue between them. These growths had gone on until at length the bloodvessels in the interior had become obliterated by pressure, and only those masses forming the outer portion could have received any nutriment through the circulation. They had in fact become foreign bodies. Within the mass several tumors were found to have undergone calcareous degeneration, as represented in the figure. Subsequently a somewhat similar case, but of less size, died at the Woman's Hospital in the service of either Dr. Sims or Dr. Peaslee.

4th. Fibrous tumors sometimes undergo disintegration and absorption. As the effect of direct injury, or in connection with the puerperal state, the mass may after sloughing undergo purulent disintegration, and this process is almost always complicated by symptoms of blood-poisoning. These tumors are also occasionally absorbed and rapidly disappear after having reached a point of development at which their supply of blood seems to be cut off.

Fig. 95.



Multiple fibroids.

Case XXVII.—I had a woman several years under my observation who was a seamstress in my employ during the greater part of the time. She had a well-defined fibroid on the anterior wall of the uterus, as large as a hen's egg, which caused much irritation of the bladder, and she suffered in addition from constant hemorrhages. I treated her for some six months without any benefit, in fact the growth increased in size. Some eighteen months afterwards she informed me that she had gone several weeks without a show, and had just passed through a natural period. On making an examination I was surprised to find the tumor had greatly decreased in size, and in two months from that time, the uterus was of a normal size, with not the slightest vestige of the fibroid remaining. The tumor from some cause had probably undergone fatty degeneration, and was absorbed.

I have had three women under observation, each with a fibroid on the anterior wall, which disappeared during a subsequent pregnancy. One of these was a lady of wealth and position, residing in Brooklyn, and in consequence of an absorption of the fibroid, I suffered in reputation among a large circle of her family connections.

CASE XXVIII.—This lady had been married a number of years and had been sterile and irregular. I was called to see her in consequence of her suffering from great pressure on the rectum, which had been increasing, and at length had become complicated with retention of urine. I found the uterus completely retroverted, with the cervix behind the symphysis, and containing a fœtus at about the third month of development. Above the pubes was found a sub-peritoneal fibroid in the anterior wall of the uterus, just above the vaginal junction. This could be felt through the abdominal parietes, and was almost as prominent and well-defined as a door knob would be when in the grasp of the hand. After emptying the bladder, she was placed on her knees and elbows, and in her nightgown, that the abdominal walls might be perfectly relaxed. I was then able, by pressure from the rectum and by aid of the force of gravity, and the leverage exerted by means of this fibroid, to lift the uterus out of the pelvis, so that the cervix was made to occupy the position in which the fundus was before the operation. When this had been accomplished, the uterus was crowded back against the promontory of the sacrum, as the fibroid rested behind the pubes. The relief was perfect, but it was evidently a question of importance to determine without delay if she could go and be delivered at full term with safety. This I did not consider myself competent to decide, and called the late Dr. George T. Elliott into consultation. The doctor made several careful examinations, and ascertained accurately, by measurement, the pelvic diameters, with the conclusion that she should go to full term. I placed her in his charge, and at my request she left home and took a furnished house in his neighborhood, that she might have every advantage. Dr. Elliott saw her frequently during the course of her pregnancy, in relation to her general condition, but did not, I believe, make an examination after the fifth month. As often, and very provokingly, happens under such circumstances, Dr. Elliott was unexpectedly detained by some case seen in consultation out of town at the time when labor came on, and the husband in his anxiety for her condition called in the late Dr. Budd to attend her. The labor was a remarkably easy one, and Dr. Budd, knowing nothing of the history of the case, and finding no tumor, expressed his doubt if one had ever existed. Dr. Elliott and myself simply had the opportunity of verifying Dr. Budd's statement that she had no tumor at that time, but we were denounced for our ignorance, and for the anxiety we had caused.

The second case was a patient in the Woman's Hospital under the charge of Dr. R. C. M. Page, while he was house surgeon in that institution. I examined the woman frequently during her stay in the hospital. She subsequently became pregnant, and after her delivery it was found that the tumor had disappeared. This fact I verified by an examination, and the woman has remained for several years under Dr. Page's observation without a return of the growth.

The other instance was in my private practice, and was seen only by myself. The tumor was much smaller than in either of the other cases, but the fact was as well settled in my mind as to its disappearance during her pregnancy.

Fibroids occasionally become the seat of sarcomatous and carcinomatous growths. I have had several instances under observation where the tissue of a single fibroid rapidly underwent the metamorphosis into sarcoma. Klebs makes the following statement in regard to these growths, and in direct connection with what has just been quoted from his work on the development of fibroids. "With these hyperplastic new formations, heteroplastic ones become associated, of which, within the fibro-myomata of the uterus, myxomatous and sarcomatous developments occur. Epithelial formations are completely wanting, and genuine carcinomata can thence only proceed out of fibro-myomata in those cases in which the formation of the tumor extends to the surface of the mucous membrane."

"The growing of the carcinoma into the myoma happens in the same way as the penetration would take place into the normal uterine muscular tissue, continuously or discontinuously. The development of myxomatous and sarcomatous tissue proceeds from the neighborhood of the vessels, and embraces usually only particular parts of the tumor, which in the one case undergo a gelatinous softening, and in another are transformed into a whitish-gray fibrous tissue. The latter especially proliferates extensively, and leads thereby to considerable enlargement of the tumor, mostly one-sided." We will have again to refer to this subject when treating of the forms of malignant disease.

It is not impossible that an aneurism may be developed in or upon a fibrous tumor of the uterus, by dilatation of one or more of its principal vessels. Its existence would be indicated by the aneurismal purr or thrill in the site of the tumor. The diagnosis must often be very obscure, and the treatment, where the tumor is so located as to render its removal or the application of a ligature impossible, necessarily involves ablation of the uterus and appendages. The cure by continued pressure is not to be hoped for. A very interesting case of supposed aneurism complicating fibroid occurred in the practice of Dr. E. D. Forée, of Louisville, Kentucky. There was a difference of opinion as to the diagnosis, but an operation was decided upon, and the lady died upon the table. A dissection of the tumor afterwards failed to reveal whether there was a true aneurismal sac, or only a cyst to which the pulsation and purr had been imparted from neighboring vessels.

Etiology of Uterine Fibrous Growths.—The statistical history and the data which the general study of menstruation presents furnish no evidence that fibrous growths ever exist at puberty. Fibrous tumors rarely make their appearance before the age of twenty-five in the unmarried, at a later age in the sterile, and at a much more advanced one with fruitful women. It is impossible to determine with accuracy the age at which these growths are most likely to appear, since their development is, as a rule, slow at first, and they may exist for an indefinite period before their presence is recognized. The age can only be approximately inferred from the average one at which professional advice was first sought, and this would seldom be before the tumor had reached a sufficient size to cause hemorrhage or some other disturbance. We may also gain some information as to the rapidity of growth from the length of time elapsing after the birth of the last child, for a fibroid, it is well known, is a cause of sterility. In Table XL. is shown the age at which 225 women, who had fibrous growths, were first examined. The earliest age was at 18, an unmarried woman; the next, a sterile woman, at the age of 22; 1 at 23; 10 between the ages of 24 and 25; and 1 at the advanced age of 58.

The age of greatest liability to fibrous growths, for all women, is shown to be between 30 and 35 years. But if we limit the consideration to those only who had fibroids and fibrous tumors, we find 35.26 years as the average age for the first, and 38.04 years for the latter (see Table XLI.). It would be natural to expect a sterile woman to seek advice at an earlier age, for the relief of her sterile condition, and this would afford the opportunity for the earlier recognition of the growth. But it is also probable that an increase in the size of the abdomen from a fibrous tumor would at first be mistaken by the sterile as well as the fruitful women for pregnancy, and so the examination would be delayed; but not so with the unmarried woman, for she would naturally seek an early explanation.

The development of these growths is retarded by childbearing, and even by marriage, for the sterile woman is less liable than the old maid, but in turn she is more so than the woman who has borne children. If we accept as the proper one the relative proportion of unmarried, sterile, and fruitful to each other given in Table III., under the head of menstruation, it will be seen that unmarried women are the least liable to fibroids, the sterile much more so (note here the effect of fibroids in causing sterility), while only a small proportion of fruitful women suffer from them.

TABLE XL.—*Ages at which 225 Women with Fibrous Growths were first examined.*

	Age at first consultation..	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	Total.
Fibroids.	Unmarried.........	....	2	2	4	6	4	....	2	....	20
	Sterile...........	....	3	9	11	7	3	3	1	....	37
	Fruitful...........	....	2	4	19	18	12	7	....	....	62
	Total	....	7	15	34	31	19	10	3	....	119
Fibrous tumors.	Unmarried.........	1	2	2	7	4	3	5	1	....	25
	Sterile...........	....	1	3	7	2	11	....	2	....	26
	Fruitful...........	....	....	3	10	5	7	8	1	3	37
	Total	1	3	8	21	11	21	13	4	3	68
Fibro-cysts.	Unmarried.........	....	....	....	....	1	1	....	....	....	2
	Sterile...........	....	1	....	1	....	....	....	....	....	2
	Fruitful...........	....	1	2	....	5	1	2	1	2	14
	Total	....	2	2	1	6	2	2	1	2	18
Summary.	Unmarried.........	1	4	4	11	11	8	5	3	....	47
	Sterile...........	....	5	12	19	9	14	3	3	....	65
	Fruitful...........	....	3	9	29	28	20	17	2	5	113
	Total	1	12	25	50	48	42	25	8	5	225
	Percentage for each period	.44	5.33	11.11	26.17	21.33	18.62	11.11	3.55	2.22	

TABLE XLI.—*Average Ages at first consultation of those who had Fibroids and Fibrous Tumors.*

Fibroids.	Average age.	Fibrous tumors.	Average age.
Unmarried	37.55	Unmarried	35.75
Sterile	33.46	Sterile	37.51
Fruitful.	35.64	Fruitful.	40.28
On all women	35.26	On all women	38.04

Table XLII. shows that of all women with fibroids 13.37 per cent. were unmarried, and 50.30 per cent. were fruitful. Both of these classes of women are thus shown to be about four per cent. less liable to these growths than their relative proportion in the total number of

TABLE XLII.—*Location of Fibroid Tumors, and Age at Puberty, etc.*

Age at first menstruation		10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	Summary.					Per-centage.	Average age at puberty.	Average age at marriage.
												In front.	Be-hind.	On the right.	On the left.	Total.			
Situation of the fibroid in the unmarried.	In front	....	1	1	1	2	....	2	....	....	....	7	....	....	....	....	....	13.71	
	Behind	....	....	....	1	5	2	1	2	....	....	....	11	....	....	....	....	14.81	
	To right	....	....	....	1	....	1	....	....	....	....	....	....	2	....	....	....	14.00	
	To left	....	....	....	....	....	....	1	....	....	....	....	....	..	1	....	....	16.00	
	Total	....	1	1	3	7	3	4	2	....	....	....	....	....	....	21	....	14.42	
	Percentage	....	4.76	4.76	14.28	33.33	14.28	19.04	9.52	....	....	33.33	52.38	9.52	4.76	....	13.37		
Situation of the fibroid in the sterile.	In front	....	1	1	5	2	3	2	4	....	2	20	....	....	....	....	....	14.95	22.70
	Behind	2	1	4	9	2	6	3	....	1	....	...	28	....	....	....	....	13.57	23.53
	To right	....	....	1	....	1	....	1	....	....	....	....	....	3	....	....	....	14.00	22.00
	To left	....	....	1	1	1	1	1	1	....	....	....	....	....	6	....	....	14.50	22.33
	Total	2	2	7	15	6	10	7	5	1	2	....	....	....	....	57	....	14.17	23.03
	Percentage	3.50	3.50	12.23	26.31	10.52	17.54	12.28	8.72	1.75	3.50	35.08	49.12	5.26	10.52	....	36.30		
Situation of the fibroid in the fruitful women who had gone to full term and had never miscarried.	In front of the uterus	....	....	....	2	4	1	4	1	....	....	12	....	....	....	....	....	14.83	19.58
	Behind	....	....	2	2	7	6	5	2	1	....	....	25	....	....	....	....	14.80	20.68
	To right	....	....	....	1	1	....	....	....	....	....	....	....	2	....	....	....	13.50	22.50
	To left	....	....	1	2	2	....	2	....	....	1	....	....	....	8	....	....	14.62	18.37
	Total	...	....	3	7	14	7	11	3	1	1	....	....	....	....	47	....	14.72	20.08
	Percentage	....	....	6.38	14.89	29.78	14.89	23.40	6.38	2.12	2.12	25.53	53.19	4.25	17.02				
Situation of the fibroid in those who had gone to full term and had also miscarried.	In front of the uterus	....	....	1	1	1	....	2	....	....	....	5	....	....	....	....	....	14.20	17.60
	Behind	....	1	2	4	5	2	2	1	....	....	....	17	....	....	....	....	13.88	19.23
	To right	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	14.00	21.00
	To left	....	....	....	....	1	1	....	....	....	....	....	....	....	2	....	....	14.50	17.00
	Total	....	1	3	5	8	3	4	1	....	....	....	....	....	....	25	....	14.00	18.80
	Percentage	....	4.00	12.00	20.00	32.00	12.00	16.00	4.00	....	....	20.00	68.00	4.00	8.00				
Situation of the fibroid in those who had never gone to full term but had miscarried.	In front of the uterus	....	....	....	....	1	....	....	2	....	....	3	....	....	....	....	....	16.00	19.33
	Behind	....	....	....	1	....	1	1	....	....	....	....	3	....	....	....	....	14.66	21.00
	To right	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..		
	To left	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	15.00	18.00
	Total	....	....	....	1	1	2	1	2	....	....	....	....	....	....	7	....	15.28	19.55
	Percentage	....	....	....	14.28	14.28	28.57	14.28	28.57	....	....	42.85	42.85	....	14.28				
Total number of fruitful women menstruating at each age		....	1	6	13	23	12	16	6	1	1	20	45	3	11	79	....	14.54	19.65

TABLE XLIII.—*Fibrous Tumors among Unmarried, Sterile, and Fruitful.*

Age at first menstruation		10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	Unknown.	Summary.	Percentage.	Average age at puberty.	Average age at marriage.
Fibrous tumors found in the	Unmarried	1	1	3	4	6	3	3	1	....	2	2	26	31.70	14.19	
	Sterile	1	1	3	4	2	3	2	4	....	....	1	21	25.60	14.09	23.47
	Fruitful	....	1	6	4	8	5	4	2	1	....	4	35	42.68	14.14	24.68
	Total	2	3	12	12	16	11	9	7	1	2	7	82	....	14.14	24.23
	Percentage	2.43	3.65	14.63	14.63	28.04	13.41	10.98	8.53	1.21	2.43					

all women under observation. But sterile women are shown in the table to be about ten per cent. more liable.

It has been already stated that any distinction drawn between a fibroid and a fibrous tumor is a conventional one. For convenience it is accepted that fibroids become fibrous tumors as they increase in size, but we cannot designate the exact stage at which one term would be applicable and the other not so. But when these growths become so large that they can no longer remain in the pelvis, they are termed fibrous tumors.

Table XLIII. is made up of cases of such fibrous tumors. The most important point presented by the table is the influence which marriage and pregnancy seem to have on such growths. Unmarried women are shown to have a liability to this form of the disease about twice as great as their general ratio, while both the sterile and fruitful women appear to be below their general average in liability—the fruitful to the extent of some thirteen per cent.

We may safely hold that all women are in early womanhood liable in about the same degree to the development of fibroids. The rate of growth, or development, however, is not only held in check by marriage and child-bearing, but we have seen that these growths sometimes disappear during or after pregnancy.

Between the ages of thirty and forty years the unmarried woman is fully twice as subject to fibrous tumors as the sterile or the fruitful. I have already referred to this subject, when treating of the causes of disease, and pointed out that this is one of the tributes which an unmarried woman pays for her celibacy. It seems as if it were the purpose of nature that the uterus should undergo the changes dependent upon pregnancy and lactation, about once in three years throughout the child-bearing period, and that if the uterus is not physiologically occupied in child-bearing a fibroid will the more rapidly develop into a fibrous tumor as the woman advances in life. This will also be the case with the married woman who has taken means to prevent conception, as well as with her who has been sterile from some cause beyond her control, but to a less degree in the latter case. I think I have had occasion to note that the sterile woman who has earnestly wished for children does not have her liability to fibrous tumor increased by the fact of her sterility, an instance, probably, of the remarkable effect of mind upon the body. Finally the woman who may have been fruitful in early life, but remained sterile long afterwards, from some accidental cause, may have a tumor developed, but is less liable thereto from having once borne a child.

We have condensed in Table XLIV. the facts concerning fibroids and fibrous tumors which are contained in the two preceding tables, showing again that the liability of unmarried and sterile women to these growths is greater than their relative proportion of all women under observation, while it is less with women who have been impregnated.

TABLE XLIV.—*Condensed from* TABLES XLII *and* XLIII.

		Fibrous tumors.	Fibroids situated in				Summary.	Percentage.	Average age at puberty.	Average age at marriage.
			Front.	Be-hind.	On the right.	On the left.				
Fibrous and fibroid tumors in the	Unmarried	26	7	11	2	1	47	19.66	14.29	
	Sterile	21	20	28	3	6	78	32.63	14.15	23.15
	Fruitful	35	20	45	3	11	114	47.69	14.42	21.20
	Total	82	47	84	8	18	239	....	14.30	22.04
	Percentage	34.30	19.66	35.14	3.34	7.53				

We will find in Table XLII. the average age at puberty and at marriage for each condition, and the locality of the fibroid with respect to each is also given, but I cannot attempt to make any definite deductions therefrom.

The same information will be found, in Tables XLIII. and XLIV., for fibrous tumors, and for all fibrous growths. In Table XLIV. we find the average age at marriage for the sterile woman to have been 23.15 years; for the fruitful woman 21.20 years; while the average for both was 22.04 years. We have here a practical point bearing upon the beneficial effect of marriage in limiting the liability to fibrous tumors. For nineteen hundred women under observation, with different diseases, the average age at marriage was 22.31 years. The average for all women who had been impregnated was 20.76 years, while for the sterile women it was 22.39 years of age. It is thus shown that the average age at marriage for the sterile and fruitful who suffered from fibrous growths, was much later than the general average.

The location of fibroids in the uterine walls is determined by some unknown law, yet one evidently exists, for about one-half of them are found on the posterior wall. Next in frequency they are found in front; then on the left; and lastly on the right side. As a fibroid increases in size, and becomes a fibrous tumor, it will be, as a rule, companied by others, and at length they all become so much inco-rated with the uterus as to render it impossible to fix upon any spe locality for them.

TABLE XLV.—*Fibrous Growths with reference to Regularity of Menstruation.*

	Condition of menstruation at Puberty.	Unmarried.	Sterile.	Fruitful.	Total and per cent.
Fibroids.	Regular from the first	17	33	50	100
	Percentage	80.95	62.26	75.75	71.14
	Regular afterwards	4	12	14	30
	Percentage	19.04	22.64	21.21	21.42
	Never regular	....	8	2	10
	Percentage	....	15.09	3.03	7.14
	Total	21	53	66	140
	Percentage	15.00	37.85	47.14	64.81
Fibrous tumors.	Regular from the first	18	14	22	54
	Percentage	72.00	70.00	70.96	71.05
	Regular afterwards	4	5	8	17
	Percentage	16.00	25.00	25.80	22.36
	Never regular	3	1	1	5
	Percentage	12.00	5.00	3.22	6.67
	Total	25	20	31	76
	Percentage	32.89	26.31	40.78	35.18
Summary.	Regular from the first	35	47	72	154
	Percentage	76.08	64.38	74.24	71.29
	Regular afterwards	8	17	22	47
	Percentage	17.37	23.28	22.67	21.75
	Never regular	3	9	3	15
	Percentage	6.52	12.32	3.09	6.01
	Total	46	73	97	216
	Percentage	21.30	33.79	44.90	

In Table XLV. is given the number of women with fibroids an fibrous tumors, who, as to menstruation, were regular from the first regular after a certain time, and who were never regular. Then the proportion of the unmarried, sterile, and fruitful women is given together in the summary, which includes both fibroids and fibrous growths. By this table we see confirmed in another form the views which have been already expressed as to the relative liability of the unmarried, sterile, and fruitful women to fibrous growths.

By comparing this table with Table III. (page 156), which shows the regularity for all women under observation, it becomes evident that those who suffered in after life from fibrous growths were in excellent health at the time of puberty, so far as this may be inferred from the condition of the menstrual flow. The proportion of those who were regular from the first is essentially the same as the general average. A larger number were regular afterwards, and the proportion of those never regular is smaller, than the general average.

A comparison must be made between Table XLVI. and the standard, Table V. (page 157), in reference to the existence or absence of pain with the first appearance of the menstrual flow at puberty.

TABLE XLVI.—*Fibrous Growths with reference to Pain during Menstruation.*

	Unmarried.	Sterile.	Fruitful.	Total.
With pain in the beginning of the flow .	5	5	6	16
Percentage	31.25	31.25	37.50	7.40
With pain during the flow	13	23	7	43
Percentage	30.23	53.48	16.27	19.50
Free from pain	28	45	84	157
Percentage	17.77	28.66	53.50	72.68
Total	46	73	97	216

The first point to be noted in this comparison is that those in whom growths were developed afterwards suffered but little pain in the beginning of the flow. But the proportion of these was greater than of those who suffered from pain during the flow, while about the same percentage as is shown by the common standard were free from pain. If, however, we take each condition separately, the difference will be somewhat more marked. A larger proportion of the unmarried seemed to have had pain in the beginning of the flow than is shown in Table V., the other differences from the standard are unimportant.

On the other hand a smaller number of sterile women had pain at the beginning of the flow. The proportion is about the same for those who suffered pain during the flow, while a larger number were free from pain. Thus showing that women who were afterwards made [illegible] of fibrous growths were in better condition at the time of puberty than other sterile women, in whom fibrous growths did not develop. In general terms the same may be said of fruitful women, although a somewhat smaller proportion of them were free from pain at the time of puberty than was the case with all the fruitful women under observation. The proportion of fruitful women who suffered during the flow was also less than that for the sterile. The same [illegible] also holds good in regard to those who suffered from pain during the flow, since the proportion of sterile women so suffering is [illegible] the greatest. It is true the number of fruitful women given in Table XLVI. is very small, and would be of little significance if the [illegible] brought out did not confirm those given for the larger number of women under observation.

Table XLVII.—*Showing the connection between the Regularity of Menstruation and Degree of Pain.*

		Regular from the first.		Regular afterwards.		Never regular.		Total number and percentage
		No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	
With pain in the beginning of the flow.	No. of cases	11	68.37	2	12.50	3	18.75	16
	Percentage	7.14	....	4.27	....	20.00	....	7.40
With pain during the flow.	No. of cases	28	64.97	10	23.25	5	11.62	43
	Percentage	18.18	....	21.27	....	33.33	....	19.90
Free from pain.	No. of cases	115	73.25	35	22.29	7	4.45	157
	Percentage	72.33	....	74.46	....	46.66	....	72.68
Total number and percentage		154	71.29	47	21.75	15	6.94	216

In Table XLVII. is shown the relation between regularity or irregularity of the menstrual flow from the time of puberty, with the presence or absence of pain at that time among women who, in after life, suffered from fibrous growth of the uterus. Thus, 16 women had pain at the beginning of the flow, of which 68.37 per cent. were regular from the first, 12.50 per cent. after a certain time, and 18.75

per cent. were never regular. Of these 11, or 7.14 per cent. of those who were regular, 2, or 4.27 per cent., of those who were regular afterwards, and 3, or 20.00 per cent., of those never regular, suffered from pain at the beginning of the flow. It is here shown that 72.33 per cent. of all women who developed fibrous growths began their menstrual life regular and free from pain. The absence of pain was evidently the rule, but the greatest percentage of those who suffered from pain did so during the flow, and were never regular. The number here is also too small to be of any significance were it not in accordance with the general rule.

The tendency during the development of a fibrous growth is hemorrhagic, since a greater portion of these tumors have their starting point in close proximity to the mucous membrane lining the uterine canal. The first symptom with many cases is a loss of blood from within the uterus, and afterwards the recurrence of hemorrhage upon the slightest provocation is the rule. There are many exceptions where, although hemorrhage was the rule in early life, the quantity became less as the development progressed. This change is due to a growth of the tumor in a direction where the circulation would be but little obstructed, or to the gradual obliteration by the tumor as it grows of the vessels in its neighborhood. Finally, in a certain proportion of cases, change of life takes place, and the tumor decreases in size, and gives no further trouble, or it remains inert, simply an inconvenience from its bulk. Table XLVIII. shows the average duration of the first menstrual flow of all women who suffered in after life from some fibrous growth. It will be observed that the averages except for the unmarried are somewhat above those given in Table XI. page 168, which was taken from all the women under observation. This is a slight indication, and only a slight one, that a more vascular condition than is usual exists in certain women at the time of puberty, and hence they are more liable to the development of these growths in after life.

It is usual to judge of the condition of menstruation by the duration of the flow, but this method cannot be exclusively followed in studying the history of fibrous growths, since it may mislead us. I have known the length of the flow to become shortened under the influence of a fibroid, but more blood lost than would be the case with a fibrous tumor, although with the latter the duration of the flow may have been prolonged beyond the average.

We will at first present these changes more particularly in connection with the duration than the quantity. Afterwards we will consider the changes in the quantity, and these after all are to be regarded as of the greater importance practically.

TABLE XLVIII.—*Length of the Menstrual Flow at Puberty, with Fibroids and Fibrous Tumors.*

Fibroids.	Average length of flow at puberty.	Fibrous tumors.	Average length of flow at puberty.
Unmarried	4.66	Unmarried	4.27
Sterile	5.29	Sterile	5.00
Fruitful	5.11	Fruitful	5.27
Average for all women	5.04	Average for all women	5.02

TABLE XLIX.—*Showing the Length of Flow in after-life in connection with Regularity and Pain.*

		Regular from the first.		Regular afterwards.		Never regular.		Total.	
		No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.
With pain in the beginning of the flow.	Number of cases........	11	....	2	....	3	....	16	....
	Length of flow..........	....	4.90	....	5.00	....	5.66	....	5.06
With pain during the flow.	Number of cases........	28	....	10	....	5	....	43	....
	Length of flow..........	....	6 37	....	5.00	....	6.00	....	6.02
Free from pain.	Number of cases........	115	....	35	....	7	....	157	....
	Length of flow..........	....	5.68	....	5.40	....	5.85	....	5.63
Total number and average length of flow.	Number of cases........	154	....	47	....	15	....	216	....
	Length of flow..........	....	4.75	....	5.29	....	5.86	....	5.05

Table XLIX. shows the length of menstruation in after life for all who had fibrous growths, and with this is given the condition as to regularity, and the pain suffered by these women at the time of puberty. The form of this table is the same as Table XLVII., with the substitution of the average length of menstruation for the percentage on the number of cases, and the two should be studied together. Two facts are made prominent by this table, viz., that the longest duration of flow in after life was among those who previously had suffered pain during the

flow, and that women who were never regular in after life menstruated longer at each period than the average.

If we turn to Table L. we can study these changes in the unmarried, sterile, and fruitful.

This table has been constructed on the same general plan as Table XII. (page 170), which may be taken as the standard in the study of menstruation.

The fibroids and fibrous tumors have each been divided into two classes, the first made up of those with whom the length of flow remained as at puberty, although, with a certain number, the quantity may have been changed more or less. The second division contains all in whom both time and quantity were changed in after life. Each division is subdivided into two sections.

The first section of the first subdivision contains those with whom the flow remained in after life the same as at puberty, whether normal too free, or scanty.

The second section of the same division, contains those in whom the length of the flow remained unchanged, but in whom the quantity became increased, lessened, or irregular, owing to the presence of the fibrous growth.

We have then given the number of cases, the average duration, and the percentages, on all these cases forming this special division in which the flow remained normal or too free, or became scanty, increased, lessened, or irregular; then the total number for the unmarried, sterile, and fruitful women, with the percentage on the total number for each condition of menstruation.

The same information is given for all those in the second division, in the first section of which are given those in whom the time was lengthened, while the quantity was increased, lessened, or became irregular. In the second section are those in whom the time became lessened, and the quantity lessened, increased, or became irregular.

Then follow the totals for all cases having fibroids, and also for those having fibrous tumors; and finally there is a summary for all cases of fibrous growths. There is first given the total number for each condition of menstruation, then the average duration of flow, and finally the percentage for each condition calculated on the total number.

There were eighty-four women, or sixty per cent., with fibroids, who averaged 5.28 days' duration of flow, as it had been from puberty. Per contra, fifty-six women, or but forty per cent. only, of all who suffered from fibroids, did undergo a change in the menstrual flow in consider the changes in the quantity, and these after all are to be regarded as of the greater importance practically.

TABLE XLVIII.—*Length of the Menstrual Flow at Puberty, with Fibroids and Fibrous Tumors.*

Fibroids.	Average length of flow at puberty.	Fibrous tumors.	Average length of flow at puberty.
Unmarried	4.66	Unmarried	4.27
Sterile	5.29	Sterile	5.00
Fruitful.	5.11	Fruitful	5.27
Average for all women	5.04	Average for all women	5.02

TABLE XLIX.—*Showing the Length of Flow in after-life in connection with Regularity and Pain.*

		Regular from the first.		Regular afterwards.		Never regular.		Total.	
		No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.
With pain in the beginning of the flow.	Number of cases........	11	....	2	....	3	....	16	....
	Length of flow..........	....	4.90	....	5.00	....	5.66	....	5.06
With pain during the flow.	Number of cases........	28	....	10	....	5	....	43	....
	Length of flow..........	....	6 37	....	5.00	....	6.00	....	6.02
Free from pain.	Number of cases........	115	....	35	....	7	....	157	....
	Length of flow..........	....	5.68	....	5.40	....	5.85	....	5.63
Total number and average length of flow.	Number of cases........	154	....	47	....	15	....	216	....
	Length of flow..........	....	4.75	....	5.29	....	5.86	....	5.65

Table XLIX. shows the length of menstruation in after life for all who had fibrous growths, and with this is given the condition as to regularity, and the pain suffered by these women at the time of puberty. The form of this table is the same as Table XLVII., with the substitution of the average length of menstruation for the percentage on the number of cases, and the two should be studied together. Two facts are made prominent by this table, viz., that the longest duration of flow in after life was among those who previously had suffered pain during the

Duration and Quantity, with Fibroids and Fibrous Tumors.

Length of Period became Increased, with the Quantity either						Length of Period became Lessened, with the Quantity either						Total. Where menstruation became changed in time and quantity.			Summary.		
Increased.		Lessened.		Irregular.		Lessened.		Increased.		Irregular.							
No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases.	Av. length of period.	Per cent. for each condition.	No. of cases.	Av. length of period.	Per cent. for each condition.
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	6	4.83	13.33
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	4	7.50	8.89
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	6.00	4.44
9	59	..	..	..	..	..	..	1	3	..	..	10	6.20	52.63	20	6.00	44.44
..	..	..	..	..	..	7	19	..	..	..	..	7	2.71	36.84	8	2.75	17.78
..	..	..	..	2	13	..	..	..	..	..	..	2	6.50	10.53	5	5.40	11.11
..	..	..	..	..	..	..	..	..	..	..	..	19	4.94	....	45	5.33	
20.00	..	..	..	4.44	..	15.56	..	2.22	..	..	..	....	....	33.92			
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	8	4.50	13.11
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	6	7.33	9.84
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	4.00	3.28
9	79	..	..	..	..	..	..	1	2	..	..	10	8.10	50.00	28	6.30	45.90
..	..	..	..	..	..	7	22	..	..	..	..	7	3.14	35.00	12	4.00	19.67
..	..	..	..	3	14	..	..	..	..	..	..	3	4.66	15.00	5	4.80	8.20
..	..	..	..	..	..	..	..	..	..	..	..	20	5.85	....	61	5.55	
14.75	..	..	..	4.92	..	11.47	..	1.64	..	..	..	....	....	35.71			
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	4	3.50	11.76
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	3	4.66	8.82
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
8	70	..	..	..	..	..	..	1	3	..	..	9	8.11	52.94	13	7.38	38.24
..	..	1	5	..	..	3	12	..	..	..	..	4	4.25	23.53	8	4.12	23.53
..	..	..	..	4	27	..	..	..	..	..	..	4	6.75	23.53	6	6.00	17.65
..	..	..	..	..	..	..	..	..	..	..	..	17	6.88	....	34	5.67	
23.53	..	2.04	..	11.76	..	8.82	..	2.94	..	..	..	....	....	30.35			
26	..	1	..	9	..	17	..	3	..	..	..	56	....	....	140		
..	5.00	..	5.00	..	6.00	..	3.11	..	2.66	..	..	....	5.55	....	....	5.51	
18.57	..	.71	..	6.43	..	12.14	..	2.14	..	..	..	....	....	40.00	....	....	64.81
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	3	4.00	12.00
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	1	6.00	4.00
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	1	4.00	4.00
6	38	..	..	..	..	..	..	..	..	..	..	6	6.33	100.	15	6.06	60.00
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	1	6.00	4.00
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	4	5.00	16.00
..	..	..	..	..	..	..	..	..	..	..	..	6	6.33	....	25	5.56	
24.00	..	..	..	..	..	..	..	..	..	..	..	....	....	23.07			
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
6	51	..	..	..	..	..	..	..	..	..	..	6	8.50	46.15	13	7.38	65.00
..	..	..	..	..	..	4	16	..	..	..	..	4	4.00	30.77	4	4.00	20.00
..	..	..	..	3	18	..	..	..	..	..	..	3	6.00	23.08	3	6.00	15.00
..	..	..	..	..	..	..	..	..	..	..	..	13	6.53	....	20	6.50	
30.00	..	..	..	15.00	..	20.00	..	..	..	..	..	....	....	50.00			
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	4.50	6.45
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	8.00	6.45
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
5	43	..	..	..	..	..	..	..	..	..	..	5	8.60	71.43	20	6.30	64.52
..	..	..	..	..	..	1	4	..	..	..	..	1	4.00	14.29	2	3.50	6.45
..	..	..	..	1	7	..	..	..	..	..	..	1	7.00	14.28	5	5.00	16.13
..	..	..	..	..	..	..	..	..	..	..	..	7	7.71	....	31	5.90	
16.13	..	..	..	3.23	..	3.22	..	..	..	..	..	....	....	26.92			
17	..	..	..	4	..	6	..	..	..	..	..	26	....	....	70		
..	7.76	..	..	..	..	..	4.00	..	..	..	..	....	6.80	....	....	5.94	
.37	..	..	..	..	..	6.58	..	..	..	..	..	....	....	34.01	....	....	35.18
43	..	1	..	13	..	22	..	3	..	..	..	82	....	....	216		
..	7.90	..	5.00	..	6.07	..	3.31	..	2.66	..	..	....	6.15	....	....	5.66	
.91	..	.46	..	6.02	..	10.18	..	1.39	..	..	..	....	....	37.03	....		

onsider the changes in the quantity, and these after all are to be egarded as of the greater importance practically.

TABLE XLVIII.—*Length of the Menstrual Flow at Puberty, with Fibroids and Fibrous Tumors.*

Fibroids.	Average length of flow at puberty.	Fibrous tumors.	Average length of flow at puberty.
Unmarried	4.66	Unmarried	4.27
Sterile	5.29	Sterile	5.00
Fruitful	5.11	Fruitful	5.27
Average for all women	5.04	Average for all women	5.02

TABLE XLIX.—*Showing the Length of Flow in after-life in connection with Regularity and Pain.*

		Regular from the first.		Regular afterwards.		Never regular.		Total.	
		No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.
With pain in the beginning of the flow.	Number of cases........	11	....	2	....	3	....	16	....
	Length of flow..........	....	4.90	....	5.00	....	5.66	....	5.06
With pain during the flow.	Number of cases........	28	....	10	....	5	....	43	....
	Length of flow..........	....	6 37	....	5.00	....	6.00	....	6.02
Free from pain.	Number of cases........	115	....	35	....	7	....	157	....
	Length of flow..........	....	5.68	....	5.40	....	5.85	....	5.63
Total number and average length of flow.	Number of cases........	154	....	47	....	15	....	216	....
	Length of flow..........	....	4.75	....	5.29	....	5.86	....	5.64

Table XLIX. shows the length of menstruation in after life for all who had fibrous growths, and with this is given the condition as to regularity, and the pain suffered by these women at the time of puberty. The form of this table is the same as Table XLVII., with the substitution of the average length of menstruation for the percentage on the number of cases, and the two should be studied together. Two facts are made prominent by this table, viz., that the longest duration of flow in after life was among those who previously had suffered pain during the

flow, and that women who were never regular in after life menstruated longer at each period than the average.

If we turn to Table L. we can study these changes in the unmarried, sterile, and fruitful.

This table has been constructed on the same general plan as Table XII. (page 170), which may be taken as the standard in the study of menstruation.

The fibroids and fibrous tumors have each been divided into two classes, the first made up of those with whom the length of flow remained as at puberty, although, with a certain number, the quantity may have been changed more or less. The second division contains all in whom both time and quantity were changed in after life. Each division is subdivided into two sections.

The first section of the first subdivision contains those with whom the flow remained in after life the same as at puberty, whether normal too free, or scanty.

The second section of the same division, contains those in whom the length of the flow remained unchanged, but in whom the quantity became increased, lessened, or irregular, owing to the presence of the fibrous growth.

We have then given the number of cases, the average duration, and the percentages, on all these cases forming this special division in which the flow remained normal or too free, or became scanty, increased, lessened, or irregular; then the total number for the unmarried, sterile, and fruitful women, with the percentage on the total number for each condition of menstruation.

The same information is given for all those in the second division, in the first section of which are given those in whom the time was lengthened, while the quantity was increased, lessened, or became irregular. In the second section are those in whom the time became lessened, and the quantity lessened, increased, or became irregular.

Then follow the totals for all cases having fibroids, and also for those having fibrous tumors; and finally there is a summary for all cases of fibrous growths. There is first given the total number for each condition of menstruation, then the average duration of flow, and finally the percentage for each condition calculated on the total number.

There were eighty-four women, or sixty per cent., with fibroids, who averaged 5.28 days' duration of flow, as it had been from puberty. Per contra, fifty-six women, or but forty per cent. only, of all who suffered from fibroids, did undergo a change in the menstrual flow in

TABLE L.—*Condition of Menstruation in After-life as to*

		PERIOD REMAINED UNCHANGED AS TO TIME AND QUANTITY, BEING FROM THE BEGINNING						LENGTH OF PERIOD REMAINED UNCHANGED, BUT THE QUANTITY BECAME AFTERWARDS EITHER						TOTAL. — Where menstruation from the beginning was unchanged in duration.		
		Normal.		Too free.		Scanty.		Increased.		Lessened.		Irregular.				
	FIBROID TUMORS.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases.	Av. length of period.	Per cent. for each condit'n.
Unmarried.	Normal	6	29	..	..	..	..	..	..	..	..	..	..	6	4.83	23.08
	Too free	..	..	4	30	..	..	..	..	..	..	..	..	4	7.50	15.38
	Scanty	..	..	..	..	2	12	..	..	..	..	..	..	2	6.00	7.69
	Increased	..	..	..	..	..	..	10	68	..	..	..	..	10	5.80	38.46
	Lessened	..	..	..	..	..	..	..	..	1	3	..	..	1	3.00	3.85
	Irregular	..	..	..	..	..	..	..	..	..	..	3	4	3	4.66	11.54
	Total	..	..	..	..	..	..	..	..	..	..	..	..	26	5.61	..
	Percentage	13.33	..	8.89	..	4.44	..	22.22	..	2.22	..	6.67	..	..	..	30.95
Sterile.	Normal	8	36	..	..	..	..	..	..	..	..	..	..	8	4.50	19.51
	Too free	..	..	6	44	..	..	..	..	..	..	..	..	6	7.33	14.63
	Scanty	..	..	..	..	2	8	..	..	..	..	..	..	2	4.00	4.88
	Increased	..	..	..	..	..	..	18	98	..	..	..	..	18	5.44	43.90
	Lessened	..	..	..	..	..	..	..	..	5	28	..	..	5	5.20	12.20
	Irregular	..	..	..	..	..	..	..	..	..	..	2	10	2	5.00	4.88
	Total	..	..	..	..	..	..	..	..	..	..	..	..	41	5.41	..
	Percentage	13.11	..	9.84	..	3.28	..	29.51	..	8.20	..	3.28	..	..	..	48.80
Fruitful.	Normal	4	14	..	..	..	..	..	..	..	..	..	..	4	3.50	23.53
	Too free	..	..	3	14	..	..	..	..	..	..	..	..	3	4.66	17.65
	Scanty	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Increased	..	..	..	..	..	..	4	23	..	..	..	..	4	5.75	23.53
	Lessened	..	..	..	..	..	..	..	..	4	16	..	..	4	4.00	23.53
	Irregular	..	..	..	..	..	..	..	..	..	..	2	9	2	2.25	11.76
	Total	..	..	..	..	..	..	..	..	..	..	..	..	17	4.47	..
	Percentage	11.76	..	8.82	..	..	..	11.76	..	11.76	..	5.88	..	..	..	20.23
Total No. of fibroids		18	..	13	..	4	..	32	..	10	..	7	..	84	..	..
Average length of flow		..	4.38	..	6.77	..	5.00	..	5.59	..	4.50	..	4.71	..	5.25	..
Percentage		12.86	..	9.29	..	2.86	..	22.86	..	7.14	..	5.00	..	..	..	60.00
	FIBROUS TUMORS.															
Unmarried.	Normal	3	12	..	..	..	..	..	..	..	..	..	..	3	4.00	15.79
	Too free	..	..	1	6	..	..	..	..	..	..	..	..	1	6.00	5.26
	Scanty	..	..	..	..	1	4	..	..	..	..	..	..	1	4.00	5.26
	Increased	..	..	..	..	..	..	9	53	..	..	..	..	9	5.88	47.37
	Lessened	..	..	..	..	..	..	..	..	1	6	..	..	1	6.00	5.26
	Irregular	..	..	..	..	..	..	..	..	..	..	4	20	4	5.00	21.05
	Total	..	..	..	..	..	..	..	..	..	..	..	..	19	5.31	..
	Percentage	12.00	..	4.00	..	4.00	..	36.00	..	4.00	..	16.00	..	..	..	38.00
Sterile.	Normal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Too free	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Scanty	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Increased	..	..	..	..	..	..	7	45	..	..	..	..	7	6.42	100.
	Lessened	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Irregular	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	..	..	..	..	..	..	..	..	..	..	..	7	6.42	..
	Percentage	..	..	..	..	..	..	35.00	..	..	..	..	..	..	..	14.00
Fruitful.	Normal	2	9	..	..	..	..	..	..	..	..	..	..	2	4.50	8.33
	Too free	..	..	2	16	..	..	..	..	..	..	..	..	2	8.00	8.33
	Scanty	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Increased	..	..	..	..	..	..	15	83	..	..	..	..	15	5.53	62.50
	Lessened	..	..	..	..	..	..	..	..	1	3	..	..	1	3.00	4.17
	Irregular	..	..	..	..	..	..	..	..	..	..	4	18	4	4.50	16.67
	Total	..	..	..	..	..	..	..	..	..	..	..	..	24	5.67	..
	Percentage	6.45	..	6.45	..	..	..	48.39	..	3.23	..	12.90	..	..	..	48.00
Total No. of fibrous tumors		5	..	3	..	1	..	31	..	2	..	8	..	50	..	..
Average length of flow		..	4.20	..	7.33	..	4.00	..	5.83	..	4.50	..	4.73	..	5.50	..
Percentage		6.58	..	3.95	..	1.31	..	40.79	..	2.63	..	10.53	..	..	..	65.7
Total No. of fibrous growths		23	..	16	..	5	..	63	..	12	..	15	..	134	..	..
Average length of flow		..	4.31	..	6.87	..	4.80	..	5.71	..	4.50	..	4.73	..	5.38	..
Percentage		10.65	..	7.41	..	2.31	..	29.17	..	5.56	..	6.94	..	..	..	[illegible]

Duration and Quantity, with Fibroids and Fibrous Tumors.

LENGTH OF PERIOD BECAME INCREASED, WITH THE QUANTITY EITHER						LENGTH OF PERIOD BECAME LESSENED, WITH THE QUANTITY EITHER						TOTAL. Where menstruation became changed in time and quantity.			Summary.		
Increased.		Lessened.		Irregular.		Lessened.		Increased.		Irregular.							
No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases.	Av. length of period.	Per cent. for each condition.	No. of cases.	Av. length of period.	Per cent. for each condition.
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	6	4.83	13.33
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	4	7.50	8.89
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	6.00	4.44
9	59	..	..	..	..	..	..	1	3	..	..	10	6.20	52.63	20	6.00	44.44
..	..	..	..	..	..	7	19	..	..	..	..	7	2.71	36.84	8	2.75	17.78
..	..	..	..	2	13	..	..	..	..	..	..	2	6.50	10.53	5	5.40	11.11
..	..	..	..	..	..	..	..	..	..	..	..	19	4.94	....	45	5.33	
20.00	..	..	..	4.44	..	15.56	..	2.22	..	..	..	....	....	33.92			
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	8	4.50	13.11
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	6	7.33	9.84
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	4.00	3.28
9	79	..	..	..	..	..	..	1	2	..	..	10	8.10	50.00	28	6.39	45.90
..	..	..	..	..	..	7	22	..	..	..	..	7	3.14	35.00	12	4.00	19.67
..	..	..	..	3	14	..	..	..	..	..	..	3	4.66	15.00	5	4.80	8.20
..	..	..	..	..	..	..	..	..	..	..	..	20	5.85	....	61	5.55	
14.15	..	..	..	4.92	..	11.47	..	1.64	..	..	..	....	....	35.71			
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	4	3.50	11.76
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	3	4.66	8.82
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
8	70	..	..	..	..	..	..	1	3	..	..	9	8.11	52.94	13	7.38	38.24
..	..	1	5	..	..	3	12	..	..	..	..	4	4.25	23.53	8	4.12	23.53
..	..	..	..	4	27	..	..	..	..	..	..	4	6.75	23.53	6	6.00	17.65
..	..	..	..	..	..	..	..	..	..	..	..	17	6.88	....	34	5.67	
23.53	..	2.04	..	11.76	..	8.82	..	2.94	..	..	..	....	....	30.35			
26	..	1	..	9	..	17	..	3	..	..	..	56	....	....	140		
..	8.00	..	5.00	..	6.00	..	3.11	..	2.66	..	..	....	5.85	....	....	5.51	
18.57	..	.71	..	6.43	..	12.14	..	2.14	..	..	..	....	....	40.00	....	....	64.81
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	3	4.00	12.00
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	1	6.00	4.00
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	1	4.00	4.00
6	38	..	..	..	..	..	..	..	..	..	..	6	6.33	100.	15	6.06	60.00
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	1	6.00	4.00
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	4	5.00	16.00
..	..	..	..	..	..	..	..	..	..	..	..	6	6.33	....	25	5.56	
24.00	..	..	..	..	..	..	..	..	..	..	..	....	....	23.07			
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
6	51	..	..	..	..	..	..	..	..	..	..	6	8.50	46.15	13	7.38	65.00
..	..	..	..	..	..	4	16	..	..	..	..	4	4.00	30.77	4	4.00	20.00
..	..	..	..	3	18	..	..	..	..	..	..	3	6.00	23.08	3	6.00	15.00
..	..	..	..	..	..	..	..	..	..	..	..	13	6.53	....	20	6.50	
30.00	..	..	..	15.00	..	20.00	..	..	..	..	..	....	....	50.00			
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	4.50	6.45
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	8.00	6.45
..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
5	43	..	..	..	..	..	..	..	..	..	..	5	8.60	71.43	20	6.30	64.52
..	..	..	..	..	..	1	4	..	..	..	..	1	4.00	14.29	2	3.50	6.45
..	..	..	..	1	7	..	..	..	..	..	..	1	7.00	14.28	5	5.00	16.13
..	..	..	..	..	..	..	..	..	..	..	..	7	7.71	....	31	5.90	
16.13	..	..	..	3.23	..	3.22	..	..	..	..	..	....	....	26.92			
17	..	..	..	4	..	5	..	..	..	..	..	26	....	....	70		
..	7.76	..	..	..	..	..	4.00	..	..	..	..	....	6.80	....	....	5.94	
22.37	..	..	..	..	..	6.58	..	..	..	..	..	....	....	34.21	....	....	35.18
43	..	1	..	13	..	22	..	3	..	..	..	82	....	....	216		
..	7.90	..	5.00	..	6.07	..	3.31	..	2.66	..	..	....	5.15	....	....	5.66	
19.91	..	.46	..	6.02	..	10.18	..	1.39	..	..	..	....	....	37.03	....		

both time and quantity, and with these the average duration wi days.

The second part of Table L., containing the history of fibrous presents so much in common with that of fibroids, on all es points, that no farther comment or explanation seems necessary, calling attention to the general increase in the averages for the of flow.

This table may be condensed and summed up in the fol Table LI. We have here the results on the total number so that at a glance the average length of flow, and the proport each condition, can be seen.

TABLE LI.—*A Summary of* TABLE L.

		No. of cases.	Total number of menstrual days.	Average length of flow.	Per fo co
Menstruation remaining unchanged from puberty, being	Normal . . .	23	100	4.34	1
	Too free. . .	16	110	6.87	
	Scanty . . .	5	24	4.80	
	Total . . .	54	234	4.37	
Menstruation changed in after life, being	Increased. .	109	708	6.49	5
	Lessened . .	35	132	3.77	1
	Irregular . .	28	150	5.35	1
	Total . . .	172	990	5.76	9
Total No. with fibrous growths		216	12,141	5.66	

The percentages for those who remained normal, too free, or would not be likely to vary materially with larger numbers when the length of flow, changes in after life, the quantity of t should be considered in connection with it, and the number o should be larger to render the conclusions reliable. By co the results based on the time of flow as given in Table LI., with t Table LII. based upon the quantity, we may arrive at some accu regard to the numbers in whom the flow would be increased or l in both time and quantity. A greater difference would necessarily exist between those irregular in time and those irregular in quantity, since the two classes would be influenced by very different conditions.

We will now consider the quantity of the menstrual flow in reference to the changes which it underwent from puberty to the date of the first examination. It must be borne in mind that Table LII. is based upon the changes in quantity, without reference to the time or duration of the flow. This constitutes an important difference, since, as has been said, the duration of flow would not necessarily indicate the quantity. Yet it is essential in the study of these growths to know the condition of the flow as to quantity, the duration being of secondary importance. In Table LII. is given the average length of flow for fibroids and fibrous tumors separately. It will be noted that the numbers do not agree with those of the other tables. The difference is due to the fact, as was shown in Table L., that with a certain number there was no change afterwards in consequence of the presence of the tumor. Between forty-five and fifty per cent. of all these cases had an increase in the quantity of the flow, and in a larger proportion with fibroids than with fibrous tumors. Some seventeen per cent. had the quantity lessened from the average existing at puberty, and the change was the greatest for fibrous tumors. A greater proportion were irregular in the quantity of the flow, but there was little difference in this respect between the two growths. Finally, it is shown that fifteen cases had already undergone a change of life. Less than two per cent. of those with fibroids had gone through the change, while there was over fifteen per cent. for the fibrous tumors. At the first glance this would seem to be a great difference, and yet it is not strange, since a greater proportion of fibrous tumors would be met with at a later period of life.

This would be an important feature should future observation of a larger number of cases establish the fact that with so large a proportion a change of life takes place through the efforts of nature. It would necessarily have a certain weight in determining a resort to extensive surgical measures at this period of life. All women were excluded who had had a show within a year previous to my examination. The flow ceased at the following ages: with 1 sterile and 1 fruitful woman, each having a fibroid, at 46 years of age for each; as to the fibrous tumors, it ceased with 3 unmarried women at 48, 40, and 51 years; with 3 sterile women at 39, 40, and 48 years; 7 fruitful women underwent the same change at the ages of 46, 30, 47, 54, 50, 46, and 53—making 45.53 the average age for cessatio of menstruation in those who had fibrous tumors.

TABLE LII.—*Average Length of Flow, given for Fibroids and Fibrou Tumors separately.*

No. of cases.	Character of growth.	Average length of flow at puberty.	After change in the flow.	Length of flow afterwards.	Percentage for each condition.
52	Fibroid	5.00	Increased	7.26	50.98
35	Fibrous tumor.	4.71		6.88	41.17
19	Fibroid	5.10	Lessened	3.21	18.62
14	Fibrous tumor.	5.38		2.81	16.47
29	Fibroid		Irregular	5.73	28.43
23	Fibrous tumor.			5.54	27.05
2	Fibroid		Ceased from change of life .	....	1.96
13	Fibrous tumor.			....	15.29

We find that these fibrous growths seem to have had but littl influence in lessening the average number of children to each woman On reaching a certain stage of development the tumor unquestionabl caused a number of miscarriages, and finally a condition of permanen sterility. But before the fibrous growths existed, or while yet i their incipiency, these women were unusually prolific. This is tru since the average number of impregnations for them is quite as grea as that taken on the general average. Thus 1249 fruitful wome under observation had given birth to 3550 children at full term, and in addition, had miscarried 1009 times, making 4559 impregnation or an average of 3.57 pregnancies for each woman.

Eighty-three fruitful women with fibroids averaged 2.34 childre at full term, or, including miscarriages, exactly three impregnation for each woman, and in the proportion of 78.31 per cent. of childre to 21.69 per cent. of miscarriages. The last pregnancy occurred a the age of 27.63 years, and the condition of sterility had average 8.01 years previous to the first examination.

Thirty-four fruitful, suffering in after life from fibrous tumors, gav birth, at full term, to 111 children, an average of 3.26 children each, and including 32 miscarriages the percentage would be 4.20 impregnations for each woman. This would be in the proportion of 77.62 per cent. of children and 22.37 per cent. of miscarriages.

With fibrous tumors, the average for the fruitful at the time of first consultation was 40.28 years, as already given. The average length of time since the birth of the last child was 11.40 years, which would make the average age 28.88 years for these cases, and the last miscarriage to have occurred at the average age of 31.06 years.

By referring to Table XLII., it will be found that the average age of miscarriage was 18.02, for the women with fibroids. Table XLIII. gives 24.68 as the average age for fibrous tumors, and Table XLIV. 21.20 years as that for all cases of fibrous growths. This would give in round numbers 3 children, or 4.20 impregnations in 6.38 years for each woman having a fibrous tumor afterwards.

Should these statistics be confirmed by future observation on a larger number of women, the inference might be drawn that an unusual number of impregnations within a limited time is as conducive to fibrous growths as is the condition of idleness or absolute rest of the uterus.

Diagnosis of Fibrous Growths.—In the early stages of a developing fibrous growth, a patient will seek relief from symptoms due to uterine displacement, such as irritation of the bladder, pressure on the rectum, or a general feeling of fulness about the pelvis, with an irregular show, or the menstrual flow too free. The patient is to be placed on the back for an examination, and this should be first made with the index finger of the left hand in the vagina, while using the right one for manipulating over the pubes. The uterus will generally be detected by the finger to be lower in the pelvis than natural, and the first impression will be that the organ is very much displaced, either backward, forward, or to one side or the other. But if the examination be continued with the aid of the other hand over the abdominal wall, the information will be soon gained that although the uterus is evidently enlarged, it is more flattened in shape than natural. That is, the uterus will seem much wider or thicker transversely than it should be, in proportion to its apparent length, as felt between the two hands. Or the uterus may seem too long for its width. In addition, the surface of the enlarged uterus may be found irregular, or a grooved surface on opposite sides may be detected, which would give the impression as if a large rounded body projected from the uterine wall. By this time the examiner will have made up his mind as to the existence of a fibrous tumor, or be in doubt between a flexure of the uterine body and a fibroid on the uterine wall. This point he may not be able to settle without resorting to the use of the uterine probe to determine the direction of the canal. It is customary to state that the presence of a fibrous growth may be mistaken for pregnancy, cellulitis, hæmatocele, extra-uterine pregnancy, or ovarian tumor. One thing should never be mistaken for another, and to avoid this it requires but a few moments longer in the examination, that we may not form any conclusion until the investigation has been thoroughly made. Even should the history of the case give no suspicion of pregnancy, an enlarged uterus, if movable, should not be mistaken for either of the other conditions. Frequently the growth of a fibroid excites inflammation in its neighborhood, so that the case becomes complicated by cellulitis, and under these circumstances the presence of a fibroid may remain for a time in doubt. But I hold it would be due only to the grossest carelessness should an hæmatocele or the slightest cellulitis exist and not be detected. The reader cannot be too much impressed with the importance of assuming the existence of cellulitis in every case, until the contrary be proved, and then to be on the constant lookout for it afterwards. And I may add this rule is equally an excellent one to adopt in general practice, without reference to any special lesion. An extra-uterine pregnancy is generally accompanied by a slight show from time to time, and the uterus is always enlarged, but a careful examination would readily distinguish the relation of the uterus to an extensive tumor in one of the Fallopian tubes, or to an abdominal fœtation in the posterior cul-de-sac. No investigation should be considered complete until after a rectal examination has been thoroughly made. The existence of cellulitis may be thus detected, and its extent be more fully appreciated than is possible by the vagina alone. This mode of examination is the only one on which an opinion of any value can be based in regard to an extra-uterine pregnancy, and the sac containing fluid can be thus readily distinguished from the unyielding uterine walls. A small cyst of the ovary will sometimes occupy Douglas's cul-de-sac, and, without the rectal examination, might be mistaken for a fibroid.

If it be deemed prudent, in the absence of cellulitis, to introduce anything within the uterine canal, Sims's elevator may be used for the purpose of forming a diagnosis. This instrument has been already described on page 28, and for this purpose it is far preferable to the sound. It can be passed into the canal, and the intra-uterine stem then secured at any angle by means of the slide. With the aid of this instrument the uterus is brought entirely under the control of the operator. By placing one hand over the abdomen, or with the index finger in the rectum, the uterus can be lifted in the pelvis, or moved in any direction by the instrument, so as to afford an accurate idea of its connection with an ovarian tumor or suspected pedunculated fibrous tumor.

In case of doubt as to the position of the fibroid, and whether it is advisable to introduce the probe, it had better be done with the patient on the side, and by aid of the speculum. We are to use the instrument simply as a probe, passing it with the same care. When this is done we can arrive at an accurate knowledge as to the direction and depth of the canal. I therefore repeat in substance what has already been stated in regard to the use of the sound, that it frequently excites inflammation; it is attended with more or less pain; and it misleads by making the uterus conform to its own curve. After its introduction it requires but little art in manipulating, by pressing the probe against the sides of the canal, or by use of the finger, to give it the proper curve or direction, and this can be done so as not to cause pain or bleeding. If the probe can be introduced without difficulty, it will be quite evident that the fibroid does not project into the canal, but lies deep within the uterine tissue. The introduction of the finger within the uterine canal necessitates that it shall be dilated. This is done by means of sponge tents, and the rules already given for their use must be carefully observed. By means of the finger within the uterine canal, as the organ is pressed down into the pelvis and steadied by the hand over the abdomen, a diagnosis can be accurately formed and the proper treatment decided upon. After ascertaining the size and general situation of the tumor, it will then be necessary to determine accurately what proportion, if any, of the tumor projects into the canal, or if the mass has already become pedunculated. But little difficulty will be experienced in obtaining all the necessary information, unless the growth is situated directly at the fundus. When in this position the most dexterous may not be able to reach the base. The plan I follow is to pass into the canal a strong tenaculum along my finger, and then bury it deep into the tissue just within the os. Then as the fundus is pressed down by the hand of an assistant, and drawn to the vaginal outlet by the tenaculum, the finger can be readily advanced by giving it a slight rotating motion. The neck of the uterus can be drawn down to the vaginal outlet with safety, provided it be done without jerking and only by steady traction. This position will enable the operator to reach the fundus from the vaginal outlet, unless the tumor is a very large one. It will then be necessary to administer an anæsthetic and introduce the whole hand into the vagina, by which means the fundus can be reached. Before attempting to pass the hand it should be thoroughly softened in hot water, and well greased. I generally at first press back the perineum for a few moments as far as possible, with two or three fingers, by gentle but steady pressure. If the soft parts be then thoroughly greased, the hand can be introduced by placing the tips of the fingers together in the shape of a cone. But it should not be forced directly in, but advanced by rotating the hand slowly as the perineum is pressed backward. Unless favored by some peculiar condition, not the slightest laceration or danger should follow this mode of examination if it be conducted with due care.

The uterus should always be restored to its proper position after having been thus dragged down, since, if this is not observed, inflammation can be as readily excited as if force had been used in the displacement. A large vaginal injection of hot water is of the greatest value after such an examination, as it will check bleeding, reduce the risk of bad consequences, and, by exciting contraction, will cause the vagina to return rapidly to its normal size.

After the uterus has become enlarged to the size of the later months of pregnancy, a mistake in diagnosis may occur from a careless examination, as between pregnancy, fibrous growth, and ovarian tumor. To fail in recognizing the pregnancy would be unpardonable, with the history of the case, and the certainty of detecting the sounds of the fœtal heart. The fact is that the same rule should be observed, as a matter of precaution, in regard to pregnancy, as I have advised for cellulitis. Pregnancy so often occurs when least expected, and often under such singular circumstances, that I recognize the importance in every case of being always on my guard. Unless the tumor be yet small, the blue appearance of the vagina cannot be depended upon as evidence of pregnancy, since this is simply an indication of a somewhat obstructed venous circulation, and the same can be brought about by pressure from a fibrous tumor if it be sufficiently large. Whenever the uterus has become much enlarged from a fibrous tumor, its surface is rarely smooth, and with a little care a number of prominent projections and inequalities can be detected as the result of [illegible] many different growths.

The rules for the differential diagnosis between a fibro-cystic tumor of the uterus and an ovarian tumor, and for the treatment, will be pointed out when we come to consider ovarian tumors.

CHAPTER XXVIII.

LOCAL AND GENERAL TREATMENT OF FIBROUS GROWTHS OF THE UTERUS.

Action of ergot, opium, alum, gallic acid, cinnamon—Incision of tumor—Enucleation—Partial removal—Disintegration—Tapping a fibro-cyst.

ALL our efforts in the treatment of fibrous growths are to be directed with a view to their removal, when it can be done with a reasonable degree of safety, or to arresting their development if possible, while we are to preserve the patient's strength by checking the constant tendency to a loss of blood.

That this subject may be made the more intelligible to the reader, we will treat of the method for removal after first considering the means to be employed in the general treatment. Different agents have been put forward, from time to time as efficacious in causing absorption of these growths, but as yet none have fairly stood the test. We are to-day ignorant of any means by which a hard fibroid can be removed from the uterine tissue, except by extirpation, yet they do sometimes disappear through the unaided efforts of nature, but we are in the dark as to the exact process.

We have already described the marked difference existing in the density and character of the tissue forming these tumors. The round and dense fibroid possesses so little vitality, in consequence of its limited supply of blood, that it is evident, little or nothing can be accomplished for its absorption. But we have seen that there are other forms of these growths, possessing more of the muscular structure of the uterus, which were developed faster, and are more vascular. Klebs has described, as we have stated, the mode of development by which these tissues are left filled with cavities in which large quantities of fluid sometimes accumulate. Experience has taught me that in these cases a great reduction in bulk may sometimes be effected by treatment directed towards promoting absorption of these fluids, and towards diminishing the amount of blood within them; but no permanent influence is exerted on the tissues themselves. General treatment, moreover, is of service, since no fact is better established from observation than that by improving the health the development of tumors will be delayed, while it is always the more rapid as the general condition becomes impaired.

Drs. Churchill and Savage recommended for this the use of iodine: Simpson and Wells, the bichloride of mercury; Simpson, the bromide of potassium; Rigby and McClintock, the chloride of calcium. The mineral waters containing the bromides have been thought to be efficacious. Ergot has been extensively employed by different methods, but until recently in an empirical manner. For electrolysis much was claimed by passing the current through these tumors by means of long needles introduced deep into their structure. Electrolysis may have been employed in some cases with benefit, but, as a rule, the contrary has been the result, while its use is certainly often attended with danger. This danger consists in the risk of exciting peritonitis or inflammation within the tissues of the tumor, and I have known of several deaths to result from the practice. I have seen beneficial results after the long use of small doses of the bichloride of mercury, in combination with an infusion of some one or more of the bitter vegetable tonics, but the effect has simply been due to the improvement in the general condition. Sir James Y. Simpson held that to gain the full effects of the bromide of potassium it was necessary to employ the remedy continuously for months, and even a year or more. I have had no experience with it thus employed, but from its use for a limited period I have never seen any effect beyond a beneficial one on the nervous system. If its long-continued use should have the effect of bringing about absorption of any portion of the tumor, the benefit would likely be but temporary. This I naturally infer, since there is always danger of producing anæmia by the long use of the bromides. The chloride of calcium I have never employed, but beneficial results have doubtless followed its systematic use. The effect has been to bring about a calcareous degeneration in the tissues of the tumor, but unfortunately it has been found that the coats of the arteries are likely to undergo degeneration also.

One cardinal rule is to be observed in the treatment of these fibrous growths: we must do nothing by which the vitality of the tumor may be destroyed while it is *in sitû*, since we then burden the case with the extra risk from blood poisoning. We are to employ any means by which the circulation can be reduced and continued at the lowest point, short of its entire arrest. For this purpose the action of hot-water injections, of iodine, and the judicious use of ergot will be found most beneficial.

From the injudicious use of ergot in large quantities much harm has resulted without the relation of cause and effect being recognized. But, as a rule, great benefit follows its use when administered in small and continued doses, with the view of acting on the coats of the vessels and of exciting only moderate contraction of the uterine tissue. Ergot should never be given in *large* doses until after the uterine canal has been dilated, and until it be found that the tumor projects sufficiently to warrant the belief that it may become pedunculated by uterine contraction. I have committed this error myself, and have likewise frequently observed it in the practice of others. Should a tumor be found buried in the uterine walls, or so situated that it cannot become pedunculated, large doses of ergot can certainly accomplish no good. But, on the contrary, if the uterus be thus excited to violent contraction without a purpose, as it were, an increased quantity of blood will naturally flow to the parts, often with the direct result of causing cellulitis and even peritonitis. By thus setting up a new source of irritation we will establish the most favorable condition for increasing the growth of the tumor.

Ergot has been administered by the stomach, by the rectum, by the vagina, and even injected directly into the tissues of the tumor, but its introduction by subcutaneous injection is likely to be the method which will come into general use.

Dr. Hilderbrandt, of Königsberg, has published[1] a report of nine cases treated in this manner. He used a solution of the watery extract of ergot, in the proportion of three parts to a little over seven parts of distilled water, with the same quantity of glycerine. He found the alcoholic solution of Langenbeck to cause pain, and claims for his solution that it is free from this objection, and is less likely to cause local irritation. He recommended "Pravaz's syringe," but the ordinary hypodermic one will answer perfectly for the purpose. The point of introduction he selected, was in the neighborhood of the umbilicus, as he found this region less sensitive to puncture than the lower portion of the abdomen. In the first case, the tumor was as large as at the seventh month of gestation. He employed the injection every day for fifteen weeks, except at the menstrual period, at the end of which time the tumor had disappeared.

A great improvement is reported to have taken place in the other eight cases, but the results were not so well marked. At my request

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[1] Treatment of Uterine Fibroids, by Subcutaneous use of Ergot. Am. Journ. of Obstetrics, Nov. 1872, from the Berlin Klin. Woch., June 17, 1872.

Dr. Bache Emmet employed this mode of treatment in a number of cases, some of whom have remained for several years under observation, with the view of testing its value. In no single instance has the tumor disappeared, but with a number there was a marked decrease in size, while with others no change was noticed. It is evident that the decrease in size is only permanent as an exception to the rule, and the use of the ergot has to be indefinitely continued. Yet when so much can sometimes be gained in checking the loss of blood, and in adding to the comfort of the patient; the means should be employed as long as benefit continues. But from some unexplained cause, in some cases, ergot seems to act as an irritant, and increases the tendency to hemorrhage after its long-continued use.

We may look for something in the future in the treatment of fibroids from a carefully regulated diet consisting chiefly of animal food. Dr. Ephraim Cutter, of Cambridge, Mass., has reported[1] seven cases with all of whom a marked change was effected. He states: "For the idea the writer is indebted to Dr. J. M. Salisbury, of Cleveland, Ohio. He regards these growths as pre-eminently due to the excess of carbohydrates, starches, sugars, and fermentable food in the diet; that they are largely disorders of nutrition, and that by feeding patients on a diet composed of animal food, the condition which was most potent in bringing on the diseased results is removed, and the system enabled to right itself by its own recuperative powers." Dr. Cutter gives a carefully selected diet list which might be found also serviceable for other forms of disease. I can state nothing from personal observation on this subject. At my request Dr. Bache Emmet has also made a test of this mode of treatment; the number so treated, however, has been limited, and the time too short, but he reports that in several instances there has been a marked decrease in size of the tumors.

It is all essential that the general treatment should be directed so as to include every means adapted to improving the health. The patient should remain in the recumbent position at the time of menstruation, or when accidentally flowing. But at other times she should be as much as possible in the open air, as the chief means at her command for maintaining her strength. When this cannot be done a resort must be made to the use of the sun-baths to keep up the proper proportion of red globules in the blood.

The preparations of iron frequently seem to increase the tendency to a loss of blood, but if the action of sunlight on the skin be kept up, the remedy will be less likely to cause disturbance. In the treatment of two cases recently, I have been particularly pleased with the marked improvement following the use of Wyeth's preparation of dialyzed iron. In both instances other forms of iron had caused headache and constipation, and an unexpected loss of blood. The condition of the bowels must be a constant care, since if they are allowed to become habitually constipated the difficulty will necessarily increase with the enlargement of the tumor, and loss of tone in the colon from over distension. It is, moreover, all important to avoid any additional pressure, since the most serious consequence will in the end result from this long-continued obstruction to the circulation in its return from the pelvis to the portal system. This condition will constantly subject the patient to unnecessary loss of blood, and thus aid materially in adding to the growth of the tumor. As the tumor increases in size it will become more difficult to keep the bowels cleared out, or to relieve the constant tendency to an accumulation of flatus which adds so much to the discomfort of the patient. A restricted meat diet would be of benefit under these circumstances if it had no other effect. The patient would necessarily be made more comfortable by food in the most concentrated form. The advantage would be that the excrementitious portion would be small, and but little material could be furnished to excite the generation of flatus. If the constipation cannot be relieved by regulating the diet, it will be necessary to combine the inspissated ox-gall with any other remedy indicated. Much relief will also be afforded by the occasional use of calomel and soda, if the strength of the patient will admit of a prompt action on the bowels. At the same time we must not be deceived by the apparently exhausted state of the patient, who may be suffering from blood poisoning due to the condition of the bowels. Under these circumstances we cannot find a better tonic than a brisk mercurial purgative, or a remedy which will so promptly check an existing hemorrhage. The tendency to an accumulation in the bowels can be obviated by the use of injections of warm or hot water and ox-gall into the rectum, while the patient rests on the knees, chest, and elbows. This injection will often not all come away by a single action of the bowels, but a large portion may be retained for a few hours in the colon, by which means the scybalæ will become dissolved through the action of the ox-gall.

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[1] "Food as a Medicine in Cases of Uterine Fibroids." Am. Journ. of Obstetrics, Oct. 1877.

In the early stages it is all important to correct a retroversion or a tendency to prolapse of the uterus from increased weight. As the disease advances it is necessary also to get the tumor out of the pelvis into the abdominal cavity, and the attempt should not be delayed until after the mass begins to cause disturbance from pressure.

Retroversion will be caused by a fibroid on the posterior wall of the uterus, or, as was first pointed out by Dr. Sims, by a growth situated in front, but low enough down to furnish a leverage, by which the fundus is tilted over through the action of the bladder. These displacements must be corrected by the proper application of a pessary, since a fibroid will increase rapidly in size if allowed to remain in a position where the circulation is constantly obstructed. When the growth has increased in size to a fibrous tumor the fundus sometimes becomes crowded into the hollow of the sacrum, forcing the os above the pubis. At length an increase of size will render it imperative that the position be corrected, and it will frequently prove most difficult to do so even with the aid of an anæsthetic. Yet, usually, with a little manipulation, and by the aid of gravity brought into play by placing the patient on the knees and elbows, it can be accomplished. A tenaculum must be hooked into the cervix, lying behind the symphysis, for the purpose of drawing it upward and towards the vaginal outlet, at the same time that moderate pressure is made in the opposite direction by a sponge probang, through the cul-de-sac against the posterior wall of the uterus. We must, however, bear in mind the fact that sometimes these tissues undergo fatty degeneration from long pressure, and may be then easily ruptured.

CASE XXIX.—About nine years ago an unmarried woman with a large fibrous tumor was sent to the Woman's Hospital by Prof. Cabell, of the University of Virginia. In this patient the uterus was very much retroverted by the large tumor in front, and the organ itself had already reached a size when the action of the rectum and bladder had become seriously interfered with. I placed her on the knees and chest, and used Sims's speculum to open the canal. My chief purpose was to lift the cervix by means of the tenaculum, and while I steadied the uterus with a large sponge probang placed in the cul-de-sac, I was not conscious of making undue pressure. Suddenly the cul-de-sac split entirely across the vagina with as little resistance as would be offered were it formed of so much wet paper. With the air suddenly rushing in through the opening thus made, the probang, some nine inches in length, was drawn out of my fingers, and, being carried by the current, almost disappeared in the abdominal cavity, whence only after much difficulty I succeeded in withdrawing it by means of a pair of forceps. The uterus was replaced by the force of the atmosphere, and the patient was unconscious of any other sensation than one of relief. I placed a sponge in the wound to collect the blood nd to prevent the escape of intestines, while ether was administered o the patient, who took it without question and in ignorance of the ccident. Six or eight interrupted silver sutures were needed to lose the rent; she was placed in bed with the full expectation on my art of an attack of peritonitis, but she had not the slightest disturbnce. This accident was witnessed by the entire hospital staff, and y several others not connected with the institution. She expressed reat satisfaction for the "operation" I had performed, but it was of ttle permanent benefit, since the tumor gradually increased in size, nd a few years afterwards she died from exhaustion. I succeeded, wever, in diminishing the loss of blood for a long time by making superficial incision along the face of the tumor, as it presented in e uterine canal, extending its whole length, from above as far as it uld be reached.

We must now consider in a special manner, and at some length, the ifferent means to be employed for controlling hemorrhage.

Position is of prime importance in its effect upon uterine hemorages. A woman suffering from a fibrous growth in the uterus ould assume the horizontal position, on the slightest appearance of a ow. This rule should be rigidly observed notwithstanding the flow ay have made its appearance coincident with the menstrual period. is necessary to do this that we may offer a check to the current of lood towards the pelvis at the beginning, and thus do much towards reaking up the habit of flowing. When in bed it is also advisable to eep the feet elevated, so as to place the patient on an inclined plane, y which means the pelvic circulation will be greatly diminished. he room should be kept cool, and the patient quiet.

There are but few remedies, for internal administration on whose irect action, any reliance can be placed, and it is doubtful if any ould be effective without the aid of both rest and position.

Ergot, opium, gallic acid, cinnamon, and sometimes the tincture of nnabis Indica, are the agents generally employed for controlling emorrhage. A number of others are usually recommended, but they re found in practice to be of little value. Ergot, as already stated, nnot be relied upon to arrest a hemorrhage, and I have frequently ticed that at the time of the flow, it has the effect of rather increasg the quantity. Unless it be employed for the purpose of exciting terine contraction, it should be administered only in moderate doses, ring the interval between the flows, and then with the view of lesning the calibre of the vessels, and so aid indirectly in reducing the pply of blood.

Opium is an exceedingly valuable remedy, since by allaying the cal irritation, it quiets the circulation through the action of the sympathetic system, and secures contraction of the capillaries, and a diminished loss of blood. It is best administered by the rectum, since it thus enables a tampon to be better borne, and leaves the stomach for such other remedies as may be deemed advisable.

I give gallic acid, and cinnamon together; a drachm of gallic acid is rubbed up in an ounce of simple syrup, to which four ounces of cinnamon water and three of pure water are subsequently added. Of this mixture a tablespoonful is to be given every two or three hours. If this dose should cause nausea it may be still more diluted, diminished in quantity, or administered at longer intervals, as the flow becomes lessened. These two remedies are more efficacious when given together, than either would be separately, but their use is somewhat empirical, from the fact that we have no very definite idea as to their mode of action. Gallic acid has no purely astringent properties, but it is thought by physiologists to undergo in the system a molecular conversion into tannic acid, and thus to determine the contraction of ultimate fibres. This may be so, but the administration of tannic acid, on account of its primary local effects on the alimentary canal, does not yield the same ultimate results as its congener, although it is excreted as gallic acid. Large doses of cinnamon have the effect of lessening apparently the action of the heart, and the drug may have some properties in common with ergot.

Dr. Churchill and Dr. McClintock both recommend highly in their works the tincture of cannabis indica, in ten-drop doses, three times a day, for arresting uterine hemorrhage. The efficacy of this remedy must be due to such properties as it may hold in common with opium. Dr. McClintock has found some cases of uterine hemorrhage where one-sixteenth of a grain of the bichloride of mercury every six hours arrested the flow, while the same effect was produced in others by pushing calomel to the very verge of salivation.

Opium, gallic acid, and cinnamon may be useful, and should always be tested, but I have found the only reliable means to consist in local applications and measures. These are hot water injections, the tincture of iodine, for dilatation of the uterine canal if necessary, and, above all, a tampon, either of cotton saturated with a solution of alum, or one of oakum. Notwithstanding the hemorrhage may be free, I do not hesitate to place the patient on the side, open the vagina by means of the speculum, and then ascertain the direction and curve of the uterine canal, by careful use of the probe. The applicator being properly curved, and a tuft of cotton twisted about it, Churchill's tincture of iodine can be applied to the fundus. Whenever the canal is suffi-

tly open for the ready passage of the applicator, I loosen the
on in the manner described in the early portion of this work, with
object of leaving it behind until forced out by the uterus. The
ing of this long strip of cotton throughout the length of the ute-
canal answers a double purpose. Its first effect is to furnish a
eus for the formation of a clot, which will control the bleeding.
length, as the clot becomes too large, and excites a sufficient de-
of pressure, uterine contraction will be excited, with effect of
elling both cotton and clot from the canal. The hemorrhage, how-
, will have been arrested by compression of the vessels in conse-
nce of the uterine contraction. Sometimes the cotton does not
te expulsive efforts enough to cause its ejection, and it should then
emoved on the next day for fear that it may again bring on bleed-
by continued irritation of the mucous membrane. Whenever a
ion of cotton is thus left within the canal, the precaution should
ays be taken to have the end projecting from the os for the reasons
ady given.

Vhen a case is regularly under treatment, the iodine should be
cted, for which we must give the proper curve to the nozzle of a
d-rubber syringe. Such an instrument is to be obtained, holding
ut an ounce of fluid, with a nozzle some six or eight inches in
gth. By smearing the nozzle with a little grease, and with the aid
spirit lamp, we can easily give it the proper curve. A portion of
iodine to be injected can be drawn up into the syringe, and the
zle then introduced to the neighborhood of the fundus, as a probe
ld be, by steadying the cervix with a tenaculum. With care, it can
passed without increasing the hemorrhage or causing any irritation.
iodine must be forced out very slowly, while the patient lies on
left side, and a sponge on a mass of cotton must be placed at the
to prevent the escape of iodine over the vaginal wall. If this pre-
tion be not taken, the irritation of the iodine over a large surface
the vagina may cause the patient much discomfort, and make it
icult to introduce the tampon properly. When the strength of the
ient will admit of the position, it is better to inject the iodine while
is on the knees and elbows, with the os exposed by the speculum,
l she should remain in this position for a few moments. In this
y every part of the canal will be reached by the iodine, and it will
re the effect of causing contraction from above downward. A pro-
e, colored, watery discharge will be caused for a short time, but
remedy, when applied in this manner, has the effect, almost
rays, of promptly arresting the hemorrhage, for a time at least.

The quantity of iodine to be injected must depend somewhat upon the size and length of the canal, but under no circumstances would more than a drachm be needed. When the long-nozzled syringe cannot be readily procured a good substitute can be made by using a flexible male catheter tied over the short nozzle of an ordinary glass urethral syringe. There will be some difficulty in introducing the pliant catheter, but this can be overcome by using the speculum, and with the syringe in one hand, portion after portion of the catheter can be passed into the canal by means of a pair of long dressing forceps. The sudden and forcible introduction of a single drop of fluid into the uterine canal, under ordinary circumstances, may be attended with the most disastrous consequences. But the danger is slight here, since the uterus is made more tolerant, and the canal is usually more or less dilated from the partial protrusion of the growth. We may, however, by undue violence, set up inflammation of the tumor, and this condition often causes an attack of cellulitis or of peritonitis.

To increase the action of the iodine a basin or more of hot water must be thrown into the vagina as the woman lies on the back with her hips elevated. The use of hot water will be found an excellent agent of itself if the proper position be observed, the water used at a high temperature, and the quantity large. A steady stream of hot water thrown into the vagina, with the stimulus of the jet to excite contraction, and prolonged for half an hour, will arrest for a time almost any hemorrhage.

The loss of blood takes place from the rupture of some little vessel on the mucous membrane of the canal covering the portion of the partially projecting tumor. Pressure will often exert a most beneficial effect by reducing the size and number of vessels. This can be applied by introducing to the fundus, on the point of the sound, an India-rubber cot or bag, and distending it by injecting water into it. These have been described when treating of sponge tents, and the means for dilating the uterine canal. The principle is the same as with Barnes's dilators, but the cots are made of different lengths, with a dilating capacity only to about the diameter of the thumb. The distinctive feature is an idea of my own, and consists in the sound passing through the centre of the dilator in a tube to its extremity. By this means the upper end can be held at the fundus while being dilated so that it cannot step out, and no power is lost in the vagina as with other dilators. I have suggested that this plan be applied to Barnes's dilators as it would make them more useful and manageable. When it is possible to introduce this bag to the fundus we cannot have a better means of controlling hemorrhage. It has the advantage that with its use the vagina need not be so distended by the tampon, although some packing will be necessary to prevent the dilator from being forced out of the canal by uterine contraction. The dilator must be first well lubricated with soap. Its introduction is sometimes greatly facilitated by the use of a whale-bone probe, which will more readily conform to the irregular course of the canal. Unless the object be to dilate the uterus, the India-rubber bag should not be distended beyond a moderate degree by which the canal will be fully occupied, and at the same time a sufficient amount of pressure will be existed to arrest the bleeding. I do not wish to impress the reader with the belief that this means can be made applicable under all circumstances. In theory the plan is faultless, but unfortunately the application is sometimes exceedingly difficult. The canal must be somewhat patulous, the condition of the patient such as to warrant the manipulation, and it is necessary that the attempt should be made on a table, and with the aid of a speculum. A stop-cock or a clamp to compress the tube may be used to retain the water, and that is to be placed several inches outside of the vagina so that it can be turned out of the way over the abdomen and caught under the napkin. The continued pressure from the distension should not be kept up longer than from one day to another. The water may then be allowed to escape and the bag gently withdrawn. To have this bag distended by means of air instead of water, would be preferable in every respect, but I have not yet devised any means for doing so.

Whenever the canal has been dilated it is a good practice to place the patient on a bed-pan, and with the finger as a guide pass the long nozzle of a Davidson's syringe, properly curved, far up into the uterine canal with the view of injecting it with hot water. I state it as the result of a long experience, now extending over eleven or twelve years, in the use of hot-water injections into the uterine cavity, that we possess no better means than this for arresting bleeding by exciting contraction in both the vessels and uterine tissue. It may sometimes test our ingenuity to get the water within the canal when it is not advisable to dilate it fully, but if we succeed its use is always satisfactory. The remarks which have been made in regard to the danger from injections of iodine, within the canal of a uterus occupied by a fibrous growth, are also applicable to injections of water: that they can be safely made if the os be patulous to a moderate degree, and the water be injected slowly and without force.

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After injecting the uterine canal or the vagina it is always advisable to again introduce the tampon, unless it is evident, beyond doubt, that the bleeding has ceased. The hot water will cause the vessels to contract, but the pressure of the tampon, if it has been applied before, may still be of service, and it should be continued long enough for them to recover their tone. I am governed somewhat by the condition of the nervous system of the patient, and always continue the tampon for a day or two after the bleeding has ceased, if she shall have been anxious about her condition. After the vaginal injection, and before replacing the tampon, it will add very much to the comfort of the patient to have the whole vagina swabbed out with a sponge probang saturated with glycerine.

There is no objection to the bowels being moved daily, but this is not likely to be the case so long as the tampon is used, nor can an enema be administered with any efficiency if the vagina is fully distended. It will, therefore, be necessary for the physician to make either two visits or to instruct the nurse to remove a sufficient portion of the tampon, by passing the finger into the vagina as a guide, for the use of the knobbed whalebone stick. The tampon should thus be partially removed, and the rectal injection administered just before the expected visit of the physician. He should be punctual to his appointment, since the danger of fresh bleeding is greatly increased by the exertion attendant upon having the bowels moved, and this cannot be guarded against.

Simpson, I believe, first divided the mucous membrane covering the tumor, by a superficial incision along the uterine canal, with the object of arresting the tendency to hemorrhage. The operation is frequently attended with good results, as it cuts off some of the supply of blood which was conveyed to the tumor through the divided vessels. This plan may be resorted to now and then during the progress of the case, and it always has the effect of exciting the uterus to a firmer contraction on the tumor.

Nélaton, and Baker Brown afterwards, divided the cervix laterally for the purpose of arresting hemorrhage, and the success was due to increased uterine contraction. Frequently this operation allowed the tumor to come down lower in the organ to a point where the uterus would be excited to exert a sufficient force to cause it to become pedunculated.

Various methods have been resorted to for the purpose of removing or destroying the tumor. Thus Velpeau and Amussat were the first to enucleate, or, by force, tear these tumors from their beds. Dr. Sims has been a recent advocate of this practice: he first separates the growth all around, by a stout steel instrument suited to the purpose, and afterwards removes the mass in sections through a comparatively small opening.

Dr. Atlee, of Philadelphia, instituted the practice of taking out a section from the tumor for the purpose of destroying its vitality, and allowing it afterwards to break down and come away. Simpson was in the habit of introducing a portion of some caustic into the interior of the tumor for the same purpose.

Sometimes the mucous membrane covering the tumor is divided from its lowest attachment upward, as far as can be reached, and its attachment freely separated. Then ergot is administered in large doses to cause uterine contraction, that the tumor may be driven out of its bed through this opening.

Other operators do not hesitate to remove any projecting portion of a tumor, which can be reached, trusting to another opportunity presenting itself for removing the remainder, or that it will ultimately become disintegrated.

All these different modes of practice are attended with great danger to the patient from blood poisoning. They should never be resorted to therefore except under some peculiar circumstances and when it may have become simply a choice of the lesser evil.

With my present experience I regard the removal of a portion only of the tumor as an unwarrantable procedure, since as we shall see hereafter, the whole can be removed with almost as much facility as a part and with less risk.

Case XXX.—Early in the winter of 1863 a woman almost forty years of age was admitted to the Woman's Hospital with uterine hemorrhage, from which she had suffered many years. She was very anæmic, the lower extremities were œdematous, and her complexion was of a straw color, showing the cachexia due to a continued loss of blood. With the aid of Dr. Winston, at that time house surgeon, the uterus was dilated after some preparatory treatment, for the purpose of forming a diagnosis.

I found a large fibrous polypus presenting at the os, which I could feel was attached to the fundus, but a little in front, and by a broad base.

With little difficulty the chain of the écraseur was adjusted, and drawn tight around the tumor, I was able to keep it up behind by a whalebone staff to be described hereafter.

A mass as large as the closed fist was removed without difficulty or bleeding. I introduced the finger afterwards, and was impressed with the completeness of the operation, the whole surface being smooth, and continuous with the sides of the canal. As the base, although large, able to again introduce the tampon, unless it is evident, beyond doubt, that the bleeding has ceased. The hot water will cause the vessels to contract, but the pressure of the tampon, if it has been applied before, may still be of service, and it should be continued long enough for them to recover their tone. I am governed somewhat by the condition of the nervous system of the patient, and always continue the tampon for a day or two after the bleeding has ceased, if she shall have been anxious about her condition. After the vaginal injection, and before replacing the tampon, it will add very much to the comfort of the patient to have the whole vagina swabbed out with a sponge probang saturated with glycerine.

There is no objection to the bowels being moved daily, but this is not likely to be the case so long as the tampon is used, nor can an enema be administered with any efficiency if the vagina is fully distended. It will, therefore, be necessary for the physician to make either two visits or to instruct the nurse to remove a sufficient portion of the tampon, by passing the finger into the vagina as a guide, for the use of the knobbed whalebone stick. The tampon should thus be partially removed, and the rectal injection administered just before the expected visit of the physician. He should be punctual to his appointment, since the danger of fresh bleeding is greatly increased by the exertion attendant upon having the bowels moved, and this cannot be guarded against.

Simpson, I believe, first divided the mucous membrane covering the tumor, by a superficial incision along the uterine canal, with the object of arresting the tendency to hemorrhage. The operation is frequently attended with good results, as it cuts off some of the supply of blood which was conveyed to the tumor through the divided vessels. This plan may be resorted to now and then during the progress of the case, and it always has the effect of exciting the uterus to a firmer contraction on the tumor.

Nélaton, and Baker Brown afterwards, divided the cervix laterally for the purpose of arresting hemorrhage, and the success was due to increased uterine contraction. Frequently this operation allowed the tumor to come down lower in the organ to a point where the uterus would be excited to exert a sufficient force to cause it to become pedunculated.

Various methods have been resorted to for the purpose of removing or destroying the tumor. Thus Velpeau and Amussat were the first to enucleate, or, by force, tear these tumors from their beds. Dr. Sims has been a recent advocate of this practice: he first separates the growth all around, by a stout steel instrument suited to the purpose, and afterwards removes the mass in sections through a comparatively small opening.

Dr. Atlee, of Philadelphia, instituted the practice of taking out a section from the tumor for the purpose of destroying its vitality, and allowing it afterwards to break down and come away. Simpson was in the habit of introducing a portion of some caustic into the interior of the tumor for the same purpose.

Sometimes the mucous membrane covering the tumor is divided from its lowest attachment upward, as far as can be reached, and its attachment freely separated. Then ergot is administered in large doses to cause uterine contraction, that the tumor may be driven out of its bed through this opening.

Other operators do not hesitate to remove any projecting portion of a tumor, which can be reached, trusting to another opportunity presenting itself for removing the remainder, or that it will ultimately become disintegrated.

All these different modes of practice are attended with great danger to the patient from blood poisoning. They should never be resorted to therefore except under some peculiar circumstances and when it may have become simply a choice of the lesser evil.

With my present experience I regard the removal of a portion only of the tumor as an unwarrantable procedure, since as we shall see hereafter, the whole can be removed with almost as much facility as a part and with less risk.

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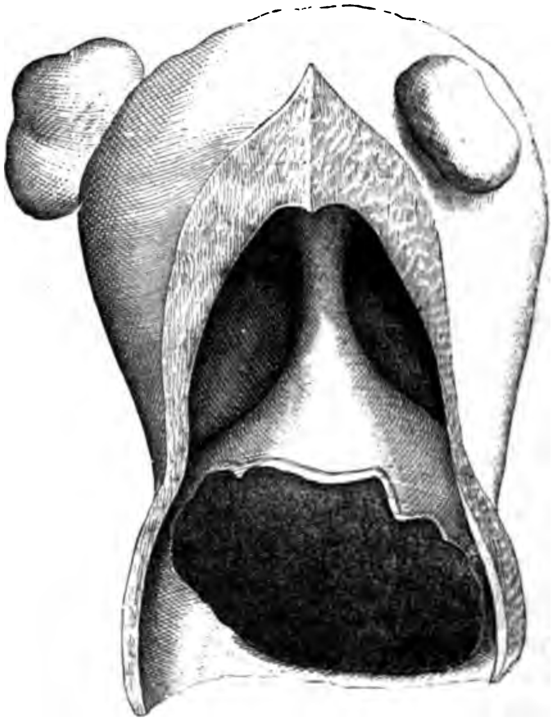
With little difficulty the chain of the écraseur was adjusted, and drawn tight around the tumor, I was able to keep it up behind by a whalebone staff to be described hereafter.

A mass as large as the closed fist was removed without difficulty or bleeding. I introduced the finger afterwards, and was impressed with the completeness of the operation, the whole surface being smooth, and continuous with the sides of the canal. As the base, although large, was so much smaller than the mass itself I took it for granted that the whole tumor had been removed, and although I noticed the size of the fundus was out of proportion to the rest of the organ, I thought this to be due to the sub-peritoneal fibroids which could be distinctly felt. A profuse discharge was noticed on the second day; this soon became offensive, and marked symptoms of blood-poisoning presented themselves. Notwithstanding frequent vaginal injections of warm water were employed, but little benefit was derived from them, and she died on the sixth day from blood-poisoning.

The post-mortem examination showed a sloughing mass in the canal which was attached by so small a pedicle that the slightest force would have removed it. The condition is shown in Fig. 96, from a sketch taken at the time. It was evident that I had cut the tumor in half and that the portion which remained was buried in the uterine tissue. The operation itself excited uterine contractions, by which the remaining portion was displaced. The tumor became more and more pedunculated, as it was forced towards the os uteri, until at length its attachment was reduced so much as to cut off its supply of blood, and the mass began to slough. The action of the uterus would have been sufficient to have driven the tumor into the vagina but for the external

Fig. 96.



Pedunculated fibroid, partially removed by the écraseur.

fibroids which were found to involve the uterine tissue enough to have caused a loss of power and irregular contraction. Her anæmic condition rendered her more liable to blood-poisoning, and less able to resist its effects. But her life could have been saved if I had suspected the true condition. I had supposed the entire tumor was removed, and then naturally attributed the profuse discharge to the large healing surface. I was unable then to do more for her locally than to direct the frequent use of the injections, but these did not enter the uterine cavity. At the present day such a case would be treated by washing out the uterine canal, and then such a mass could not to be overlooked.

The study of this case was an instructive lesson, and ultimately led to the plan of treatment which I shall describe hereafter.

It is quite as hazardous to cut into a projecting mass, since the tissues must then slough away, and the danger of blood poisoning would be as great as if a portion were removed. The same objection must exist against exciting inflammation within the structure of the tumor by the use of the cautery, caustics or other agents, with the view of bringing about disintegration. No man possesses the means of limiting to the tumor the inflammatory process which may be established by this mode of treatment. A number of successful cases have been reported, but were we as familiar with the death record as we are with the result when the treatment has been successful, no conscientious man would ever attempt to destroy a uterine tumor by disintegration.

The following case will illustrate the danger of simply cutting into a projecting mass without any knowledge as to its depth or attachment within the uterine tissue.

Case XXXI.—June, 1871, I dilated the uterus of a patient in the Woman's Hospital, and detected near the fundus a soft tumor about an inch in diameter which was partially pedunculated, and was supposed to have been the cause of hemorrhage. On the anterior wall near the fundus to the right was felt through the abdominal wall a subperitoneal fibroid a little smaller than a hen's egg. This tumor seemed to be on one side, and acccidental in its connection with the growth within the canal. Dr. T. G. Thomas, a member then of the consulting board, was present, and examined the case at my request. From its shape and position it was impossible to encircle it with the chain of the écraseur, and it was too soft to be drawn down with a tenaculum sufficiently within reach of the finger, as a guide for its removal. I therefore decided to destroy it by cutting open with a pair of scissors the portion protruding, and I believe the procedure met with Dr. Thomas's approval. The operation was easily done, and by the injection of iodine the slight bleeding was promptly arrested.

The discharge was very profuse after the third day. To guard against blood poisoning I directed the nurse to introduce the nozzle of the syringe just within the patulous os, and gently wash out the uterine cavity at the time of administering the usual vaginal injections. This was done for a week or ten days, and the patient was apparently doing well. One morning during the administration of the injection, the patient suddenly complained of great pain and discomfort. On removing a nearly empty bed pan the nurse realized that some serious accident had occurred, and I was sent for. The patient died in a few days from a violent attack of peritonitis. The post-mortem disclosed the fact that the sub-peritoneal fibroid had become displaced, leaving a smooth opening as if made with an inch augur, from the uterine canal through the fundus into the peritoneal cavity. The tumor was found lying behind the uterus in a bed of lymph. It was soft, and the portion which had been imbedded in the uterine tissue was ragged and sloughing. Over the opening through the fundus the intestines had become adherent in attempt to repair the injury. At the time I supposed two distinct growths had existed, and in their development the intervening uterine tissue became absorbed, so that they lay in contact. It was thought, as the growth within the uterine cavity disintegrated, that the outer tumor became involved and loosened from its attachments, so that it was at length easily displaced by the injection. It is now evident to my mind that there existed but a single tumor, and I have met with other instances where parts of the same tumor were of a different character.

In practice the question will present itself as to the proper course to be followed in the treatment of fibro-cyst. The primary fibrous tumor of the uterus may become at length a secondary matter in comparison with the cystic formation springing from it, and frequently it seems to become blighted by the second growth. Fortunately these cysts develop so slowly that many years may elapse before it may become necessary to interfere. When the distension finally becomes so great as to demand relief, it will be necessary then to empty these cysts by tapping.

This operation is attended, as a rule, with more risk than the emptying of an ovarian cyst. The escape of fluid is more likely to excite peritonitis, and the sac itself is more liable, from its greater degree of vascularity, to become inflamed after being tapped. As a rule, the quantity of fluid accumulating in any one cyst is smaller than with an ovarian tumor, it is, therefore, more difficult to obtain the same relief. The fluid should be removed, when possible, by means of the aspirator and through a small-sized canula. The operator must determine the size by the condition of the case, since if fluctuation be distinct, a small canula will, in all probability, answer. Should the tapping have been successful in removing a large portion of the fluid much valuable information may be then gained, to be utilized in case any operation may become advisable. It will be proved beyond question, by future experience, that many of these cases can be relieved by surgical means. If after tapping, for instance, it be found that the fluid was contained chiefly in a single sac, an exploratory operation would be justifiable in case it should refill. By opening the abdomen it may be found that the sac sprung from a point around which a ligature could be placed so as to admit of its removal. I assisted the late Dr. Peaslee, some years ago, in an operation at Astoria, for the removal of a tumor which had been tapped before, and was supposed to be ovarian. In this instance the cyst grew from the fundus of the uterus. A double silk ligature was passed through just close enough to the uterus that the bottom of the sac would be obliterated when it was tied. The sac was then cut off as close to the ligature as was deemed safe, and the abdomen closed as after ovariotomy. This woman recovered without bad symptoms, and there seemed to have been no further development of the tumor.

Extirpation of the Uterus.—The temptation frequently presents itself to perform this operation at the urgent request of some long sufferer, who has at length reached a stage when life itself becomes of little value, and the slightest hope for the future compensates for the risk.

To remove the uterus when enormously enlarged from a fibrous growth is unquestionably one of the most formidable operations a surgeon can be called upon to undertake. The degree of success which has so far attended the operation offers but little encouragment for the future. M. Péan, of Paris, presented, in 1873, seven recoveries out of nine cases where he removed the uterus for fibrous growths. As this success has not been equalled by any other operator, we must suppose it to have been accidental, and that subsequently he himself has not been so fortunate, as already five years have elapsed since his last report. It is true that the difficulties of execution are by no means so formidable as were presented in the early history of ovariotomy, and we have now the advantage of this experience, since there is necessarily much in common in the two operations. But the removal of the uterus with the ovaries, which are taken away at the same time, is attended by a degree of shock only equalled by the most extensive injury to which the body could be subjected. With the results of the operation in this country no surgeon is justified in attempting to remove the uterus for the growth of a fibrous tumor, except as a forlorn hope. The difficulty of diagnosis, however, between an ovarian tumor and a fibro-cyst ~~are~~ is sometimes so great that an operation for the removal of the former may have become far advanced before the true character could be established. Then the operation may have reached a stage where the danger would be less to the patient to remove the uterus. The uterus has been removed under these circumstances, and frequently through an error in diagnosis, the true condition being detected only after completion of the operation.

With a large solid tumor, the difficulties are far greater than would be the case in the removal of an enlarged uterus in connection with a fibro-cyst. The latter operation approaches nearer to that for the removal of an ovarian tumor, and the shock is rarely so great as with a large fibrous tumor. To guard against a fatal hemorrhage, when the tumor is a large and solid one, it is always necessary to pass a stout temporary ligature as low down as possible, or to apply Storer's clamp before cutting away the mass. Until this is done, no plan can be formed as to the proper manner by which the stump should be secured. With a fibro-cyst, the lower portion of the uterus is often so elongated by the upward traction, that it forms a pedicle, frequently not thicker than that often found attached to an ovarian tumor. This is to be secured by a double ligature passed as near to the vaginal junction as practicable without injury to the bladder. In every respect the after-treatment of the case would be essentially the same as after the removal of an ovarian tumor.

CASE XXXII.—In 1874 a woman applied to me at the Woman's Hospital for the removal of a large ovarian tumor. After a careful examination, and on passing the probe to the depth of seven inches into the uterus, I pronounced the case one of fibro-cyst, and declined to operate. As she was leaving the building, Dr. Sims met her and brought her back to examine her as a matter of interest. He decided that it was an ovarian tumor. I then made a second investigation, and came to the conclusion that Dr. Sims's diagnosis was correct. I was the more confirmed in this opinion from the fact that after many attempts I could never again introduce the probe to a greater depth than two inches and a half. An examination with the finger gave no evidence from the vagina that the uterus was enlarged, but, on the contrary, it seemed rather under size. Drs. Peaslee and Thomas subsequently saw the case, and both regarded it as an ovarian tumor. After opening the abdominal wall, the adhesions were found to be so extensive that I could form no idea of the character of the tumor. It was tapped and freed sufficiently to admit of a more thorough examination. I found it adherent to the bladder, and along the brim of the pelvis to the pelvic fascia. I succeeded in separating it from the fundus of the bladder without rupture, but notwithstanding the greatest care I ruptured the iliac sheath on the right side in freeing an adhesion. There was a single adhesion high up to the rectum, which was in turn separated. The mass which remained evidently included the uterus, but this could not be distinguished. A double ligature was passed and secured at the base of the mass. On making an examination, I found that my first diagnosis was correct, and that I had removed the uterus just above the vaginal junction. The uterus had been drawn out to the length indicated by the passage of the probe, but the canal a short distance up made a sharp curve which I had once by accident passed. The woman never rallied from the operation, and died in a few hours. This case is presented to show the difficulties sometimes met with in making a diagnosis between a fibrocyst and an ovarian tumor.

CHAPTER XXIX.

SURGICAL TREATMENT OF FIBROUS GROWTHS OF THE UTERUS.

Pedunculated fibroids—Polypi—Écraseur—Removal by traction—Removal of the ovaries for profuse hemorrhage from fibrous tumors.

Pedunculated Fibroids.—Under certain circumstances it may be good practice to open the abdominal cavity for the purpose of removing pedunculated fibrous growths from the uterus, particularly now that the introduction of the antiseptic method has so greatly reduced the risk of surgical procedures.

As soon as I should be able to satisfy myself of the existence of a sufficient length of pedicle, I would not hesitate to perform the operation, if the pressure of the tumor caused great irritation. A double silk ligature should be passed through the pedicle at a short distance from the uterus, and properly tied. The tumor is then cut away and the abdomen closed as after ovariotomy.

A tumor with a pedicle of sufficient length to admit of much motion would, by pressing on the bladder or rectum, and by displacing the uterus, cause more irritation than even a larger tumor closely attached. It may, by traction, excite cellulitis, or even peritonitis, and may cause effusion into the peritoneal cavity.

Fibrous Polypi.—We are now to consider the most important portion of this subject, since nature often attempts to effect a radical cure of fibrous growths by giving them a polypoid shape. And experience has demonstrated that art can supply no safer or more effective method than that suggested by nature.

We have already explained the method by which a tumor lying near the lining membrane becomes ultimately forced out of its bed into the uterine cavity. Fig. 96, page 558, represents the appearance of this attachment by a pedicle. This pedicle, or stalk, connecting the tumor to the uterus is formed by a small bloodvessel, a little connective tissue, and the lining membrane which the tumor had carried before it. Owing to peculiarity of structure a polypus may have so short a pedicle as to remain in close contact with the surface from which it has been expelled. Under other circumstances we will find the pedicle drawn out to a great length, so that the polyp may remain within the uterine canal, or be expelled by the uterus into the vagina without breaking its connection. I have seen an instance of a fibrous polypus, as large as a walnut, hanging out of the labia, and connected with the uterine wall by an attenuated pedicle. But, as a rule, the little artery by which it is nourished becomes at length so stretched that the supply of blood ceases, and the tumor then begins to slough in the vagina. This is a very frequent termination of the efforts of nature to effect a cure, and the mass may come away as a whole or gradually disintegrate. Cases are occasionally found with the polypus projecting from the os uteri, where no hemorrhage has occurred, and often not even a leucorrhœa has been noted. In other instances the hemorrhage gradually ceases as the tumor is driven out of the uterine canal, and it may remain in the vagina afterwards without producing irritation. A polypus in this condition, if sufficiently nourished, may have its investing membrane undergo a change so that it will resemble that of the vagina.

A polypus projecting from the os uteri cannot be mistaken for any other condition than an inversion of the uterus, and it would be well for the reader, in this connection, to consult the chapter on that lesion.

So long as the tumor remains within the uterine cavity no accurate diagnosis can be made until the os is dilated sufficiently for the introduction of the finger. The directions which have been given for dilating the uterus are sufficiently explicit, and need not be repeated.

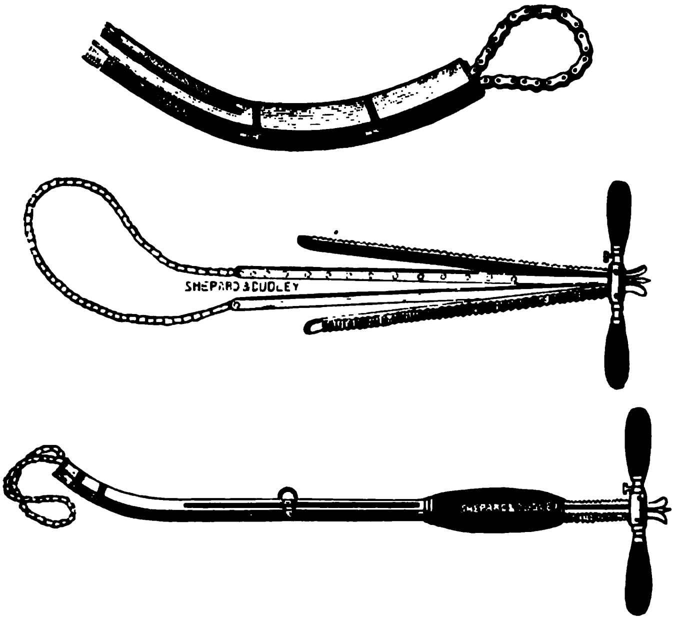
The most important points to be first determined in regard to a polypus are its position and size of pedicle. When the attachment is to the walls of the uterus, the lower portion, at least, can generally be felt, and then, with a knowledge of the depth of the canal beyond this point, as shown by the use of the probe, the size of the base can be obtained with accuracy. In other words, the base, or pedicle, will always extend to the fundus from the lowest portion. The movement of the sound in different directions about the tumor will also aid in forming the diagnosis. With the finger of one hand within the uterus, touching the lower portion of the base, and with the other over the abdomen, we can gain a knowledge of the size of the tumor. When the attachment of the polypus is at the fundus it may be very difficult to reach it, and we may not be able to gain any accurate information as to the size until, at the time of the operation, the tumor is dragged down for its removal. The degree of rotatory motion which can be given to the tumor by the finger is a valuable indication as to the size of the pedicle; of course, the smaller the pedicle in diameter the more freedom must exist.

For the operation no preparatory treatment is necessary beyond evacuating the contents of the rectum and bladder. Formerly the general practice was to pass a ligature around the base of a polypus, and day after day it was tightened, generally by twisting, until, at length, the cord would cut through the mass as it sloughed. Dupuytren was the first to remove uterine growths by dividing the pedicle with scissors, but the practice cannot be said to have ever come into general use, through fear of hemorrhage.

The removal by ligature or torsion continued to be the practice until Chassaignac devised the écraseur for the removal of hemorrhoids, when it came into use for this branch of surgery. This instrument encircles the mass by a chain loop which crushes its way through as the loop is reduced in size, and by lacerating the tissues lessens the liability to hemorrhage. Afterwards other instruments were constructed on the same general principle, a wire being substituted for the chain. This was done in consequence of the difficulty of applying the chain, and it was thought easier to get a loop of wire around a tumor within the uterus. Sometimes the wire loop could be managed with more facility, but altogether it possessed no advantage over a well-made chain. Quite the contrary in fact, for I have found that the wire is more liable to break when subjected to the same degree of strain. To make the écraseur better adapted for this branch of surgery it was afterwards curved to conform somewhat to the relation of the uterus with the vagina. But frequently the tumor within the uterus would be so situated that when the chain was tightened it would be acting almost at a right angle to the instrument. The effect was that the shorter the loop became the greater would be the strain, and the instrument was frequently broken.

To obviate this and other difficulties, I had an instrument constructed some ten or twelve years ago on a plan of my own. An important feature was the placing of two or three joints at the end of the instrument, so that it could be opened straight or bent upon itself at a sharp angle. The instrument in general use would, under some circumstances, where it could not adjust itself, cut off a mass obliquely, but this could never occur from one with these joints. Instead of the chain being joined to the ratchet portion, as in the original instrument, this was separated into two parts, so that between them two flat rods, or bands, to which the ends of the chain were attached, could slide through to the handle where they were secured by a spring-catch. The object in having the ends of the chain attached to rods which could be separated from the instrument, was to facilitate the passage of the chain around a tumor when the latter was beyond the reach of the finger (see Fig. 97).

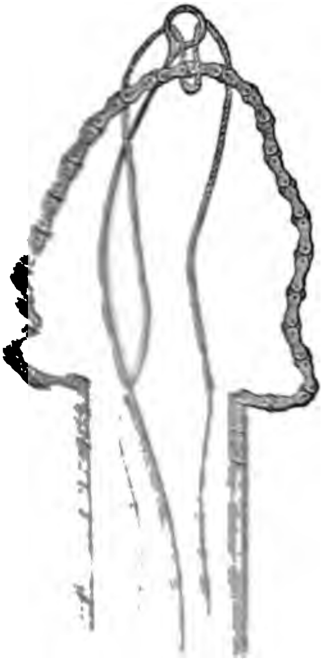
Fig. 97.



Emmet's Écraseur.

Fig. 98 represents a copper sound with a small circular eye in the extremity, which may be made by bending round the end and soldering it. Or an opening large enough may be first made in the end of a flat piece of whalebone which has been soaked in hot water to prevent splitting, and then the edges can be rounded or smoothed down into the shape of a probe by using the sharp edge of a piece of glass recently broken. The whalebone makes a very good substitute for the copper sound, and the instrument I first employed was made of it. Through this opening both ends of a strand of catgut is to be passed after including the chain in a loop, as shown in Fig. 98, and should be long enough to reach the handle of the instrument when they are drawn tight. If, for example, a polypus be attached to the anterior portion of the uterus, the copper guide should be first bent to about the proper curve, and then passed to the fundus behind the tumor, as the woman lies on the back with the legs flexed. If the two ends of the cord have been held taught, the loop of chain will of course have been carried up to the same position, or they can easily be so by making traction. The instrument is then to be handed to an assistant, who will hold it and the ends of the cord out of way by moderate pressure downward against the perineum. The operator now takes in each hand one of the rods to which the end of the chain is attached, and after passing up one on the right of the tumor and another on the left side, the two are to be brought together in front. When this has been done, the two rods are brought one above the other and secured together as one piece, by certain pins and socket holes at the opposite end near the handle. After these have been properly joined, the end is to be pushed down the sheath [illegible] On the sheath slides a spring-catch, resembling in appearance a key on a cornet à piston, and this slips at length into one of a number of holes on the upper surface of the rods, so that they can be drawn back until secured by slipping through a catch in the handle. On the under side of the instrument is the usual slide by which the ratchet surface becomes fixed and made ready for work. As the chain is held up by the instrument on the distal side, it must encircle the base, close to its attachment all round, as soon as it becomes tightened. The guide can then be removed, and if the catgut strand does not follow by moderate traction made on one end, it may be allowed to remain. A small cord would answer, but the catgut is preferred, since this substance would be less likely to catch in the joints of the chain. A great leverage is gained at the handle by the construction of this écraseur in which the ratchets are separated. This instrument I have used but little, from the fact that I had already,

Fig. 98.



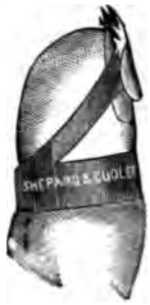
[illegible]

years before its conception, substituted the use of the scissors in some form for almost every operation in this branch of surgery. The écraseur is an efficient instrument for the removal of polypi, but not an essential one.

After having satisfied myself that the case is not one of inversion of the uterus, I pass up alongside of the index finger a strong tenaculum and then hook it deeply into the body of the polypus. This will allow the operator to draw down the tumor with one hand while he retains the finger of the other hand within the uterus. At length the point of attachment will be reached, for the tumor will soon be forced lower by the uterine contractions which are excited on making traction. The assistant is now to hold the tenaculum, while the operator passes up a pair of properly curved scissors along his finger to the base of the tumor, for the purpose of dividing the pedicle.

Figure 99 represents a steel instrument terminating in a serrated edge, which is to be placed over the extremity of the index finger, to take the place of the finger nail in separating tissues. The edge catches under the nail, and the finger is kept from slipping forward by the little hood placed just behind the saw to protect the nail. The extremity of the finger below is left uncovered, so that by the sense of touch this saw-like surface can be directed with as much accuracy as if the finger nail was used. I have never tried this instrument with a cutting surface in the place of the serrated one, but I have no doubt that it might be useful. Whenever the space is a limited one, so that the finger cannot be used as a guide to direct the course of the scissors, this serrated surface can be employed to great advantage. It will separate the tissues as rapidly as they could be by any other means, if the serrations are properly made and the parts are kept on the stretch. But it can be used for little more than dividing a pedicle, as the finger soon becomes tired and cramped from the tight fit of the band around the finger, which is necessary to prevent the instrument from slipping off. One rule to be observed when the pedicle is being divided is, that if it is small in diameter it may be cut through close to the uterus, but if short and broad, the separation should be made near the tumor, for fear that a partial inversion or indentation may be caused by the traction. I have known of two instances in the practice of others where the uterine wall has

Fig. 99.



Emmet's enucleator.

been performed from not appreciating this possibility. Under ordinary circumstances it is not necessary to remove the entire pedicle, for if a portion is left it soon shrinks and disappears. The after-treatment will be described in the next chapter while detailing the history of some prominent cases.

Removal of Fibrous Growths from the Uterus by Traction; and After-treatment.—From observation I have come to the conclusion that fibrous tumors become pedunculated only when situated at a point where the force of gravity comes into play. This force acts as a source of irritation to excite the muscular fibres of the uterus to contraction.

I have observed that the muscular fibres do not contract equally throughout the whole organ. From some change of structure, due in all probability to the long-continued pressure of the tumor, the fibres forming the outer wall of the uterus, and covering these growths, lose to a great extent their contractile power. In corroboration of this supposition it has been noted that when marked uterine contraction is excited an apparent sinking in of the sub-peritoneal surface frequently takes place to an extent corresponding to the interstitial tumor beneath. If the contraction be prolonged, the extent of the depression will diminish just in proportion as the tumor is forced into the uterine canal. About the circumference of this neutral space of uterine tissue, forming the outer wall of the tumor, the muscular action is more marked than at any other point—a natural result that the greatest action should be in proximity to the seat of irritation. The neutral surface, when thus encircled by a contracting band, continues to be crowded in upon as rapidly as the space below becomes vacated, and the tumor is pedunculated in proportion to its advance into the uterine canal. This depression I have felt distinctly when the uterus was in a state of active contraction, but it has been a question in my mind if any real displacement of this neutral space takes place, unless the greater portion of the tumor has already been forced into the vagina. I am rather inclined to the opinion that a circular ridge is formed by the damming up, as it were, of the contracting muscular tissue about this surface, which thus acts as an obstruction.

When a tumor is situated at or near the fundus we can hasten the termination of the case by exciting contraction in the muscular fibres by the use of ergot, as is the accepted practice; or we may aid the action of gravity to excite this uterine contraction, by dilatation of the os uteri or by incising the cervix. But there are many cases where the tumor is not so favorably situated in which the action of gravity cannot be exerted, and where uterine contraction, if excited, would be lost or would be inert in displacing the tumor from its bed.

For the relief of a large number of these cases it has been my practice to excite uterine contraction by making traction on the growth in the direction of the uterine outlet. This action I have continued until the tumor becomes pedunculated, from being crowded out of its bed by muscular contraction closing in around and behind the mass.

This action may be illustrated by the removal of a body from a mass of India-rubber. If the rubber were stationary, and sufficient traction were made by a tenaculum on the foreign body buried in the mass, the result would be similar to the process by which a tumor becomes pedunculated. We substitute force for the action of gravity, and the natural contractility of the substance may be likened to the muscular action of the uterus. Now, when this body is drawn out clean from the mass it will have become pedunculated, and no cavity will remain, since the contractility of the substance was sufficient to close in behind pari passu with the advance. Therefore, when traction is made on a tumor, with the effect of exciting sufficient muscular action, the space which was filled by the growth will become immediately obliterated; or, at least, there will never remain more than a small and superficial cavity. My attention has been directed to this subject for a number of years, but the development of my views and practice to the present standpoint has been very gradual.

The following case is of interest as the starting-point in the practice, and represents an important feature in the history of the subject:—

Case XXXIII.—In 1863 a patient was admitted to the Woman's Hospital with a fibrous tumor, distending the uterus to its size at full term, a portion of which filled the vagina and had already begun to slough. I could form no idea by a digital examination as to its attachments. I applied a pair of forceps, with the view of delivering the mass so that I could reach its base, around which I intended to apply the chain of the écraseur. My efforts, however, were fruitless, as the tumor was too large above to enter the pelvis. Fearing to leave the patient in this condition, I passed, with the aid of Gouch's canula, a stout twine around the mass, as high up as I could, within the uterine cavity. At the end of the cord I made a slip-knot and strangulated the mass to control the hemorrhage which I anticipated. Steady traction was made on the cord by an assistant, for fear that hemorrhage would occur should the noose become relaxed. I proceeded to remove the mass, piece by piece, with the aid of a large tenaculum and a pair of properly curved scissors. After I had [illegible] the vagina continued [illegible] at the beginning [illegible] immediately before me. [illegible] size of the uterus [illegible] the cord was [illegible] introduced my hand [illegible] by pulling down [illegible] pedicle was reached. [illegible] of an ounce of [illegible] that the mass [illegible] the cord, just as [illegible] it contained had [illegible] surprise to me, for [illegible] for such a mass [illegible] index finger. Pre- [illegible] of the tumor [illegible] of the ope- [illegible] depth. The mass [illegible] quantity of fluid [illegible] of the tumor [illegible] patient recovered with- [illegible]

[illegible] have employed the [illegible] the chain or wire [illegible] this country for the [illegible] removing as large [illegible] loop of the instru- [illegible] the above. This [illegible] tumor was gradually [illegible] scissors as I have de- [illegible] only by myself, [illegible] time to time, by [illegible] T. Howard, of Balti- [illegible] myself, and others have [illegible] in this case was [illegible] general use for this [illegible]

[illegible] XXXI.—[illegible] a patient was admitted to the W[illegible] H[illegible] imbedded in the greater [illegible] uterus. The tumor encroached on [illegible] far as to give a marked curve to the canal, nearly the whole mass being interstitial. The case was under the care of Dr. John G. Perry, then one of the assistant surgeons, who, by my advice, continued the use of sponge-tents for some two months or more. After an absence of several weeks she returned to the hospital in consequence of continued pain from uterine contraction. The os was found dilated to some four inches in diameter, with the tumor presenting as a child's head. A broad attachment could now be felt just above the vaginal junction, somewhat less in width than the portion of tumor occupying the canal, while previous to leaving the hospital merely a uniform projection existed. June 3, I operated by passing well up into the canal a large tenaculum, and by steady traction drew down, or rolled out, into the vagina a large portion of the mass. I took out with a pair of scissors a large wedge-shaped portion, and as the traction had already excited uterine action, I removed piece after piece, as the tumor could be drawn down, until the uterus was emptied. When the pedicle was divided it was less than half an inch in diameter, and was formed by the capsule covering that portion of the base of the tumor which was nearest to the uterine outlet at the beginning of the operation. The location of the pedicle at the lowest point, I have noticed, has been without an exception. I have referred to the recorded history of the case, and find that the depth of the uterus was not noted, but my impression is that it was eight inches previous to the operation. The lower portion of the base was felt just within the cervix, and the attachment of the tumor extended from that point to the fundus. The base therefore could not have been less than seven inches in length, with a width of from three to four inches. I purposely commenced the traction as high up as possible, and away from the lower portion of the base. I excited muscular action at the fundus, where it seems always to be greater than in any other part of the organ. As I rolled out the tumor from above, its separation advanced from this point downward as the uterus contracted on the diminishing size of its contents. The portions of this tumor weighed together four pounds and a half.

Case XXXV.—A case similar to the first one given was admitted to the hospital in 1869, in the service of Dr. George T. Harrison. The vagina was filled by a portion of the tumor, which had begun to slough, and the patient already presented the symptoms of blood-poisoning. I used a cord for the purpose of making traction in the beginning, but afterwards drew down the tumor as I have described, and removed it piecemeal. The pedicle was not larger than the index finger, yet previous to the operation I am certain that fully one third of the tumor was interstitial. This seemed to be the case, at least so far as an opinion could be based on the passage of the sound as an indication of the depth of the uterine canal. This tumor was also filled with cysts and their contents lost, but the portions removed weighed a little over five pounds.

Case XXXVI.—March, 1874, I received from Dr. D. E. Kissam, of Brooklyn, a patient in my private hospital who had long suffered from excessive hemorrhage. She was so anæmic that for nearly a month I carefully controlled the loss of blood, and directed my attention to improving her general condition before I deemed it safe to attempt any operative procedure. The uterus was very much anteverted, enlarged at the fundus, and somewhat pear-shaped. The sound passed five inches posteriorly to the base of the tumor and three inches in front of it. As soon as the condition of the patient admitted of doing so, I dilated the uterine canal fully, and reached the lower portion of a tumor with a base below of some three inches in width. Every other day I dilated the canal and passed high up within it an ergot suppository. One was introduced also into the rectum every night, and on alternate days in the morning as well as at night. These were made by Dr. Squibb of gelatine, glycerine, and the aqueous extract of ergot, in equivalent to one hundred grains of the powder. Marked uterine contraction followed the use of these suppositories, but the effect was more decided when introduced directly within the uterine canal.

(A practical point has been overlooked in the treatment of these cases, should it be proved that the absorbing power of the uterine lining membrane is always as active as it seemed to be in this instance. Iodine, for example, as we all know, is taken up so as to be detected by the taste of the patient almost instantaneously. This is the only case in which I have used these suppositories within the uterus, but do not think they could have acted merely as a foreign body, from the rapidity with which they were dissolved.)

The uterus became broader at the fundus, from before backward, and altered in shape so much that a projection was formed on the posterior wall as the tumor was crowded in that direction; but no advance was made toward the uterine outlet, nor did the base lessen in diameter. At the end of some ten days I felt satisfied that nothing more could be gained by delay. Although the os below was kept fully dilated, the expulsive power was lost, as in a shoulder presentation. No advance could be made, as, from the situation of the uterus and the tumor, the action of gravity could not be exerted. I decided to remove the tumor with scissors, and placed the patient under ether; but at the end of an hour I was obliged to abandon the attempt. I could barely reach the most depending portion of the tumor with my finger, and failed in getting a loop or any contrivance around the growth by which I could draw it down. March 3d, a week after, in the presence of Drs. Kissam, George T. Harrison, and Bache Emmet, I again made the attempt. I first retroverted the uterus, and then gradually drew it down to the vaginal outlet. (When necessary the uterus may be thus brought with safety within reach, if no cellulitis has existed, and if the movement has been made by gradual traction without jerking.) The uterus was held in this position by a stout tenaculum in the hands of an assistant. I then passed the index finger within the uterine cavity as a guide, and seized with a double tenaculum the fibroid high up posteriorly. By steady traction in the course of half an hour I succeeded in drawing a portion of the tumor through the os, and for the first time was able to pass my finger around the base. The tumor was a half spheroid in shape, situated near the fundus in the anterior wall, about three inches in diameter at the base, and unusually dense in structure. To give more room I removed with the scissors the portion which had been drawn out from the os. I introduced my hand within the vagina and the fingers into the uterine cavity, and made traction on the mass with a tenaculum in the other hand. I requested Dr. Kissam to place his hand over the fundus to steady the organ and press it down into the pelvis. The uterus was now contracting with great force, and as I crowded my fingers in around the base to aid the process of pedunculation, if I may use the term, I could feel the contracting wave passing in a spiral or an oblique direction around the uterine walls. The muscular contraction was more marked immediately around the base, as it seemed to crowd up on the tumor. Suddenly Dr. Kissam informed me that the uterus was becoming inverted, and I noticed at the same time that the base of the tumor was lessening in diameter. I passed my hand over the abdomen, and as the uterus contracted I could feel the cup-like depression distinctly through the relaxed abdominal wall. I was pleased at the prospect of the inversion, for I felt satisfied after enucleating the tumor I could easily replace the uterus. I therefore redoubled my efforts to bring about this condition, but noticed the size of the depression diminished as the base of the tumor became smaller. This depression may have been accidental, or it may have been more marked in consequence of the violent uterine contraction, and in extent would necessarily bear a relation to the size of the tumor imbedded beneath. These are points which must be settled by future observation. But in watching this case, with my fingers encircling the base of the tumor, while the uterine tissue was contracting around it, I realized for the first time the manner in which a growth becomes gradually pedunculated as the force of gravity comes into play. It was now evident to me that the traction which I had practised for years, without appreciating cause and effect, had produced the same result. I also appreciated that the uniformly attenuated pedicle, which I had always noticed, had been a natural result of the traction I had employed, and not accidental. Early in the operation I called the attention of the gentlemen present to the appearance of the portion of the tumor which I had drawn out beyond the labia. As I made traction to excite the muscular action of the uterus, the mass became blanched, and remained so as long as the action was kept up. After the uterus, however, had begun to force the tumor out of its bed, this bloodless appearance became permanent. In this case, as is the rule, the pedicle was formed at the lowest point of the base nearest to the uterine outlet. It was unusually small, and when divided was not larger than an ordinary lead pencil, and yet the base was about three inches in diameter at the beginning. This was fully appreciated by the gentlemen who assisted me, for on making the examination but a slight pit or depression could be detected with the finger to mark the point of attachment. The operation lasted an hour and a half, and when completed the uterus was three inches and a half in depth. After the operation I carefully replaced the uterus with the finger to its normal position in the pelvis. This patient made a rapid recovery, and two years later visited me in perfect health.

In the future history of the operation this case must be a prominent feature, since it solved the problem which I had been studying for ten years. It at once placed the operation on a scientific basis, and the process was then shown to be in accordance with the laws of nature.

Case XXXVII.—December 8, 1874, as I was about to commence my clinic at the Woman's Hospital, Dr. Whitall, the house surgeon, informed me that he had been obliged to substitute a patient just admitted, for operation, whom I had not examined. While she was being etherized, I learned that during her last labor, three years previous to admission, her physician had been obliged to remove a large growth from the uterine cavity, which had obstructed the delivery. Menstruation had been free, lasting a week; and for a profuse leucorrhœa, with a constant bearing down and a backache, she had sought relief. The doctor had examined the case and reported the existence of a large mucous polypus projecting from the os uteri. The speculum exposed a soft vascular growth as large as an English walnut, with an attachment to the posterior lip almost as great. There had been double lateral laceration of the cervix, and although this growth was outside of the uterine cavity, it really sprang from a surface which formed a part of the cervical canal before the accident. The appearance of the tumor was unusual and led to further examination. I found the uterus very wide from before backward for its apparent depth, and by the rectum detected a deep depression near the fundus, as if from inversion. But the passage of the sound forward five inches indicated the presence of a fibrous tumor in the posterior wall, extending nearly to the fundus without encroaching on the uterine canal. The growth was very soft, and bled profusely in consequence of the tenaculum tearing out on making the slightest traction. I therefore resorted to my favorite means for the purpose—a cord with a slip-knot. The tissue of the pedicle, which had been drawn out, was dense, and I soon discovered that it was inclosed within a sheath having an origin deep within the uterine wall. I divided with the scissors the sheath around the supposed pedicle, close to the uterine surface, and proceeded to make traction as I separated the tissues with my index finger. I was soon satisfied that it was a portion of the fibrous tumor occupying the posterior wall of the uterus, and having advanced so far I had no alternative but to enucleate the whole tumor. In the course of half an hour I succeeded in drawing out a mass some four inches in length, round, and of nearly uniform thickness throughout of an inch and a half in diameter. In the beginning, while making steady traction, I confined myself to separating the tumor from the tissues as it presented itself at the opening. The hemorrhage was profuse, and increased so rapidly when I had withdrawn about half of the tumor, that I hastened the operation by introducing my finger and breaking up its attachment in advance. After the mass had been removed I found the cavity was two inches and a half in depth, and the remaining posterior wall of the uterus so thin that I was surprised it had not been ruptured. An equally thin septum existed in front, between the cavity and the uterine canal, which had not been entered. The traction had excited the muscular uterine tissue to action, and the size of the organ had materially lessened; but the posterior wall being so thin, the contractile force seemed lost in that direction. Notwithstanding the depth of the cavity had been shortened an inch and a half, it was my impression its capacity had been but little diminished, since its width was greater than that of the tumor after its removal. A portion of what seemed to be a capsule presented at the opening, which I seized with a tenaculum, and drawing down that which was loose, removed it with the scissors. The patient was now placed on the back, over a bed-pan, and the cavity washed out with a quantity of very hot water, by means of a Davidson's syringe. She was afterwards replaced on the left side, and Sims's speculum introduced, as at the time of the operation. The cavity was dried by a large sponge probang, and as soon as it was withdrawn, two drachms of Churchill's tincture of iodine was injected. By use of the hot water the size of the cavity was greatly reduced and the bleeding diminished, but the iodine contracted it still more, and entirely arrested the hemorrhage. Some pledgets of cotton saturated with glycerine were introduced into the cavity, now about an inch and a half in depth, and the vagina was moderately tamponed with cotton dampened with a solution of alum. On the second day after the operation all dressings were removed and the cavity carefully syringed out with warm water, to which had been added some carbolic acid. This treatment was continued from day to day without a bad symptom presenting, and the cavity rapidly decreased in size. December 19th, eleven days after the operation, the temperature suddenly rose to 103°, and symptoms of blood-poisoning were detected. A speculum examination was made, and a sloughing mass exposed, which at first glance appeared to be the posterior lip. I found that it was a portion of what had been thought to be the capsule protruding, behind which a cyst had formed, containing about two ounces of a thick gelatinous fluid. After puncturing the cyst I removed the remains of the covering by means of scissors, and by tearing it away with a strong pair of forceps. There was some bleeding, but the quantity was not excessive. Curiosity prompted me to pass my finger to the bottom of the cavity, when I detected another fibroid, a little smaller than a pigeon's egg, just projecting sufficiently for me to map out its size. This I seized with a strong tenaculum, and as traction was made by Dr. Whitall I cut it out from its bed with a pair of curved scissors. The uterus contracted promptly on its removal, and it was beyond question due to the presence and position of this little fibroid that the cavity had not been more reduced in size at the time of the first operation. I again injected the iodine, and as it excited the uterus to further contraction the bleeding was entirely arrested. January 7th, I found the cavity from which this tumor had been removed now obliterated, and the uterus three inches deep. On the 12th instant she was discharged from the hospital cured.

Pathologists teach us that the dense fibrous tissue which formed the mass of this tumor has a very different origin and history from the soft and vascular growth found projecting into the vagina, and supposed to spring only from a mucous surface.

I have met with another instance, like the above case, where an apparent mucous growth merged so gradually into the dense tissue of a true fibrous tumor that the contrast could only be drawn between the extremes. And I think a third case might be claimed in the one I have already presented, as illustrating the danger of cutting into a growth while ignorant of its connections. This case will be recalled by the fact that the subperitoneal fibroid became detached, leaving an opening between the uterine canal and the peritoneal cavity. In this case a doubt may justly be advanced as to the condition being proved, for it is possible that the inflammatory process set up in the tumor, by cutting into it, may have extended to a fibroid lying in contact.

But there can be no doubt of the fact that, in the other cases, this soft tissue was continuous and sprang from the fibrous tissue. In both instances the specimens were unfortunately lost, so that no microscopic examination was made as to the true character of the tissue.

These cases seem, in the absence of other light, to indicate that this fibrous tissue will sometimes undergo structural changes, depending upon position and surrounding circumstances. It is, therefore, probable that this dense tissue which had been long subjected to pressure from uterine contraction may, if freely supplied with blood, become in time entirely changed in character after being relieved from this pressure. If this be not true we must assume that the growth was sarcoma, and yet, in the first instance, it had been seven years, and in the other nearly four years, since the operation.

The mass projecting into the vagina had, of course, a capsular covering consisting of the endometrium and a small quantity of connective tissue. But the portion of supposed capsule left in the cavity was simply an outer lamina of the tumor itself. In fact, it was the appearance of the tissue in this case which first suggested the doubt in my mind as to the existence of a capsular covering for these tumors. My opinion now is that the tissue, which at any time seems to be a capsule, may subsequently become a part of the tumor proper, and be covered in by new accretions, if the mass continues to grow.

The pressure, in this case, of the little interstitial fibroid unquestionably interfered with and limited the proper degree of uterine contraction, so that quite a large cavity remained after the operation. These single tumors exercise a very important influence, which the surgeon should appreciate as fully as the obstetrician. I am satisfied that many cases of apparent atony of the uterus and of irregular action, as in the hour-glass contraction, are due to the presence of isolated fibroids, so situated as to obstruct the proper contractile action of the uterine tissue.

The following case will be of interest in this connection, and to show the uncertainty which must exist as to the depth to which these tumors penetrate the uterine tissue.

CASE XXXVIII.—Some years ago I assisted Dr. Cutter in Newark, N. J., to remove a large tumor from the uterus. A portion of the growth presented through a well-dilated os, and the lower portion of the attachment was within reach on the anterior wall, some two inches within the canal. I passed the chain around the growth, but as it was being attached to the instrument it slipped from the fingers, and it became necessary to re-apply it. The chain was again adjusted by her physician, and finally attached to the écraseur, after great difficulty, from the fact that it seemed to include a much larger portion of the mass than before. The hemorrhage was excessive from the beginning, and increased to such an extent that it became necessary to remove the mass as rapidly as possible. To control the bleeding, ice-water (it being convenient) was injected into the uterine cavity to excite contraction. This was promptly established, but the bleeding was not arrested, and the condition of the patient became critical. As soon as the écraseur had cut through and had been withdrawn, I passed my hands within the uterus, and found its cavity occupied by two tumors, the one above overlapping the other. When I applied the chain it passed between them and encircled the lower one, but a portion of both had been included in the last adjustment. Passing my hand over the abdomen, I felt a sub-peritoneal fibroid as large as a hen's egg, on the anterior wall near the fundus and to the left. I was satisfied the uterus could not contract sufficiently to control the hemorrhage with so large a mass attached to its wall and filling its cavity. I therefore attempted to break down and tear away with my fingers the remains of the tumors. This brought on violent uterine contraction, but irregular in course, so that the organ assumed somewhat of the hour-glass form. I felt the canal suddenly encroached upon, and on placing my hand over the abdomen found the external tumor had disappeared. I attempted to enucleate the presenting mass by opening the tissue with my thumb-nail, when it split, and the tumor escaped so suddenly from its bed that my first impression was that rupture of the uterine wall had occurred. The uterus now contracted uniformly and rapidly, so that the remaining masses were soon removed, and the hemorrhage arrested. This patient convalesced slowly owing to the great loss of blood, but she ultimately recovered.

I am satisfied that this supposed sub-peritoneal fibroid was imbedded in the tissue of the uterus nearly to the lining membrane of its cavity. Fortunately by the uterine contractions which were excited, the tissues crowded upon the tumor so as to force it in the direction of the canal, and, although it left a very thin septum of uterine tissue beneath the peritoneum, the cavity was soon closed up by the rapid decrease in the size of the uterus. Yet had the uterus been of a much less size and this tumor had become displaced, an opening would have remained between the uterine canal and the peritoneal cavity.

Had the portion of this tumor, lying so close to the uterine canal become inflamed the whole mass would have become loosened with a similar result as the case previously cited.

I had already removed eleven or twelve large tumors by this method, and a number of small fibroids without a fatal result until the following operation. The case will be given at length as the best means of familiarizing the reader with the details and of presenting the difficulties which must sometimes be encountered in this operation.

CASE XXXIX.—Miss W., aged 28, of Bridgewater, Vt., was admitted to the Woman's Hospital, May 21, 1876, with the following history:—

Puberty was established at the age of 13; the menstrual flow lasted four days, with pain during the first day. She continued in good health until some eighteen months ago, when the period became gradually more painful throughout the flow, with an increase somewhat in quantity, but the duration remained unchanged.

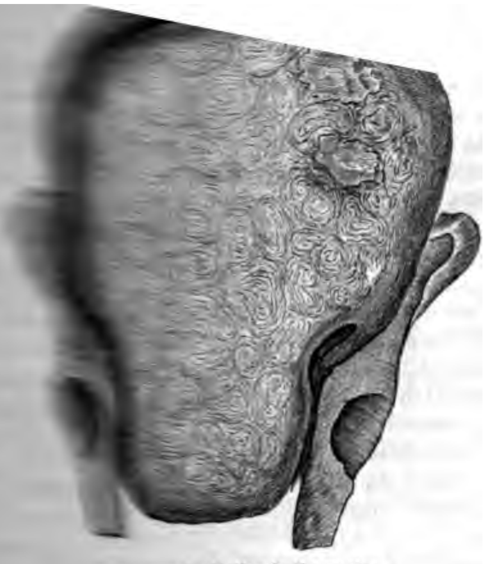
About eleven months previous to her admission she began to appreciate a feeling of weight in the abdomen whenever she suddenly changed her position in bed. During the autumn of 1875 she noticed an increase in size, and in January last she detected, for the first time, a distinct mass just above the pubes. This enlargement increased rapidly in size until April last, when she consulted Dr. Rodiman, her physician, who detected a fibrous tumor. After the examination she had a hemorrhage lasting a week, *which was the first and only abnormal loss of blood.* The menstrual flow had continued regular as to time, and had *never lasted over four days.* The increase in quantity would not have been noticed if her attention had not been directed to it by her mother, who informed her that she used more napkins than had been her habit when at her age. Her physician administered the fluid extract of ergot, in drachm doses, three times a day, with the effect of arresting the hemorrhage, but the record of her case does not state how long its use was continued.

At my first examination, I found the abdomen filled with a tumor extending above the umbilicus, with its lateral diameter the greatest. The vaginal outlet was small, as well as the vagina itself. The uterus was reached high up in the pelvis, and, as in the early stage of labor, the cervix had disappeared, the os was dilated, its edges were thin, and the tumor presented. The finger could be readily introduced within the uterine cavity, and the lower attachment of the tumor was felt just within the anterior lip, a little to the left side, with a broad base, increasing rapidly in width from below upward. The uterine probe was introduced within the cavity nearly eight inches, but in consequence of the great curve of the canal, running up posteriorly and to the left, it was not certain that the fundus had been reached.

May 25, at 12 M., one-half drachm of the fluid extract of ergot was administered, with the effect of exciting uterine contraction within twenty minutes after it had been taken. This dose was repeated in the evening, and three times on the 26th inst., with the effect of causing no disturbance of the stomach, but frequent uterine contractions. May 27, 9 A. M.—The ergot was omitted, and morphine administered to lessen the severity of the uterine pains; this was repeated at 3 and at 9 P. M. Although the pains had been frequent and severe at times, she had continued to go to her meals and to be about her room until bedtime of the 27th inst. She remained in bed during the 28th inst., as the tumor was advancing into the vagina, and the ergot was again administered in sufficient doses to keep up a moderate degree of uterine contraction. At 9 P. M., May 28, I made an examination, as Dr. Anway, the house surgeon, had detected, as he thought, some odor. I found the vagina about half filled by the tumor, the os well dilated, without the slightest evidence of decomposition. The patient complained of feeling tired, but was cheerful, and I felt that the case was progressing favorably. I made no change in the treatment but to discontinue the ergot, and found, on inquiry, that the vaginal injections had been given regularly. May 29, she was kept quiet in bed, and somewhat under the influence of morphine, as she was beginning to feel exhausted from the uterine contractions. May 30, in the morning, the odor was marked for the first time, and at 2 o'clock I commenced the removal of the tumor, after the patient had been placed under the influence of ether.

I found the tumor now filling up the whole pelvic canal, and was already breaking down in the portion presenting. Its shape was not unlike that of the cork of a champagne bottle, the compressed portion being in the pelvis (See Fig. 100). I first attempted, but failed, to pass a cord around the mass by means of Gouch's canula. To this I wished to make a slip-knot, to be used in making traction and to steady the mass as it was being removed.

The operation was proceeded with by the removal of the mass from the vagina, piece by piece, with the scissors. I would advance my index finger of the left hand as high up behind the mass as I could, and, while protecting the soft parts, draw down, with a double hook, some portion of the tumor into view. Although the uterus contracted promptly from the beginning of the operation, and firmly compressed

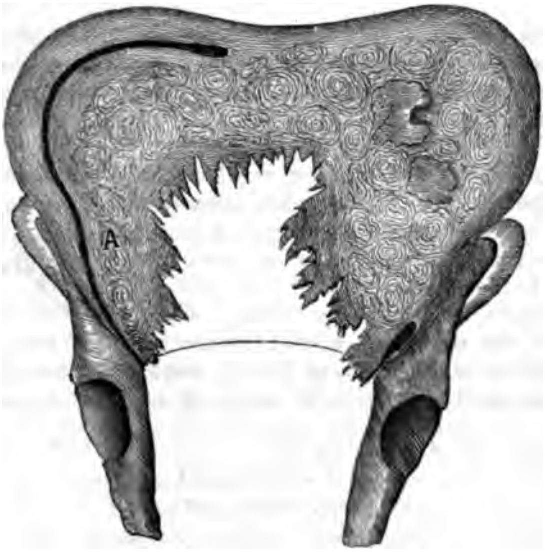


[illegible] tumor, projecting in the vagina.

[illegible] experience in realizing that the [illegible] completing the operation than to leav [illegible] break down in a few hours, and li [illegible] continued to advance through the cer [illegible] was almost beyond reach of my in [illegible] necessary to introduce my hand within th [illegible] was partially lacerated. Th [illegible] the tumor had been broken down

I placed the patient on the left side and introduced the largest size Sims's speculum. The appearance presented by the dilated vagina, in connection with the excavation which had been made into the tumor, was indeed formidable. By means of a large hook, I drew forward the lower edge of the tumor, on the right side, at *A*, Fig. 101, until I brought into view a portion of the surface which projected into the uterine canal. This I seized with another hook, and being the outside of the tumor, and covered with the lining membrane of the canal, was firmer. I was soon able to advance several inches beyond, and, while steady traction was made by Prof. Howard, of Baltimore, who was then assisting me, I was able to remove with the scissors a large mass which had lodged on the brim of the pelvis. The uterus began now to change rapidly in shape, and the whole circumference of the os was brought into view. By contraction of the uterus the remains of the tumor were forced into the vagina as fast as the mass within reach could be removed. At length the attachment was reached, and was found to have been reduced to a pedicle not larger in size than the index finger. The uterine cavity was yet sufficiently dilated to admit of partial inversion by traction, and the pedicle, formed at the lowest point of attachment, just within the anterior lip, was divided in view at the labia. The inverted portion was returned without difficulty, and by the use of Sims's speculum the whole cavity was brought into view. By this means it was demonstrated that there had been no enucleation of any portion of the tumor, and that the

Fig. 101.



Fibrous tumor, partially removed (uterus expanding laterally).

whole lining membrane of the cavity was intact, except at the point where the [illegible] had been divided. By contraction the tumor had been detached from the uterine tissue, and as it closed in behind the mass its cavity became lessened until the extent of attachment, which had existed at the beginning, became gradually narrowed to but little more than the outer covering of the tumor, which then formed the pedicle.

The cervix was found very much discolored, and had already begun to slough, in consequence of the continued pressure which the tumor had produced on the brim of the pelvis. The patient was placed on the back, with a bed-pan under her, and, by means of two Davidson's syringes, a large quantity of hot water was thrown into the uterine cavity, with the effect of causing rapid contraction. She was again placed on the side, and the speculum introduced. The uterine cavity had now been reduced to the depth of some five inches, but as an additional precaution Churchill's tincture of iodine was applied to the cavity and to the blackened surface of the cervix. The patient was then placed into bed in a much better condition than she had been at one stage of the operation, when her pulse indicated an approaching collapse. Some ten drachms of brandy were, from time to time, administered in small quantities, by means of the hypodermic syringe. Without its judicious use by my assistant surgeon, Dr. George T. Harrison, and Dr. Anway, the house surgeon, I believe she would have sank before the operation could have been completed.

The operation occupied two hours and a half, and the tumor, as removed, weighed eight pounds, without estimating the loss in the contents of several small cysts which were erupted. The loss of blood throughout the operation was small in quantity, and confined almost entirely to a small vessel ruptured in the perineum. Two dense fibroids, one as large as a hen's egg, were turned out from the mass, [illegible] different in character from the tissue surrounding [illegible] undergone calcareous degeneration, but [illegible] difficult to cut into them, and had evidently [illegible] compression.

[illegible] the pulse became weaker and rose to [illegible] to sink rapidly, soon became uncon[illegible] a half after the operation. She had [illegible] the operation, and the same condition [illegible] death.

[illegible] in her case, it should be stated [illegible] to any treatment, she had already [illegible] that she would die. Her last act, [illegible] was to designate the clergy[illegible] funeral. She certainly was [illegible] operation than myself.

[illegible] in the history of this case [illegible] importance to be fully con[illegible] That there should have been so little menstrual increase from the growth of such a tumor is an unusual circumstance. From this fact, and in consequence of being in such a perfect state of health, the shock of the operation was greater than it would have been under ordinary circumstances. It is probable that the point had already been reached in the progress of the case when the uterus would have forced, in a few days, the tumor into the vagina. It is also likely that its course may have been as rapid without the aid of the ergot, and the same steps of the operation would then have been as imperative. Yet the result in this case has impressed me with its bearing. In a like case, with the general health unimpaired, and with the tumor so large above, I should, in the future, bring about a more gradual dilatation, if it were possible to control the action of the uterus. By this course a degree of tolerance may be established, and the shock of the operation lessened. In proportion to the action of the uterus must its own supply of blood be lessened, and that to the tumor cut off, thus increasing the danger of blood-poisoning from sloughing of the parts most subjected to pressure. In consequence of the unusual shape of this tumor the cervix was forced back upon the brim of the pelvis, and from continued pressure it had already begun to slough some hours before the portion of the tumor presenting in the vagina gave any indication of breaking down. On the morning of the operation there were symptoms of blood-poisoning detected, which impaired her powers of resistance to the shock of an operation unusually prolonged by the difficulties in its execution. Yet, guided by past experience, the progress of the case was carefully watched, and the time of the operation well chosen. For, under ordinary circumstances, it is advisable to dilate rapidly, and to delay the operation until the tumor begins to break down. We thus insure the greatest amount of dilatation to be gained, with the advantage of there being as much of the tumor already in the vagina as possible before commencing the operation.

In concluding the clinical portion of this subject I will present a case similar to the preceding one, but in which the operation was delayed too long. I had previously seen the case in consultation with Dr. S. Whitall, of this city, and finding the vagina already occupied by a portion of the tumor, I urged an operation without delay. She had been flowing almost continuously for weeks, and, in her reluctance to leaving home, she delayed going to the Woman's Hospital, hoping that the flow would stop of itself when she should be in better condition. After her admission the operation had to be delayed some two weeks more, as she was in a state of such extreme prostration that [illegible] a thorough examination of her case [illegible]. During the interval the flow was checked and every means was employed to [illegible] her general health.

The following history of her case is taken from the hospital records.

Case [illegible].—Mrs. [illegible], aged [illegible], the mother of one child, was admitted to the Woman's Hospital [illegible]

She had been [illegible] a patient in the hospital and under Dr. [illegible] from [illegible]. During this time she [illegible] the [illegible] of the tumor [illegible] and she had been kept [illegible] under the use of ergot. [illegible] the time of her discharge there had been [illegible] the uterus was [illegible] the time of her admission the period still lasted [illegible] and the [illegible] of blood was [illegible]. This [illegible] had [illegible] years.

Since her discharge from the hospital [illegible], she had been losing large quantities of blood at every period and requiring the [illegible] very frequently, although she had continued the use of the ergot. Her appearance was one of extreme anæmia, her skin looked [illegible]; she was very much emaciated and looked ten years older than she really was.

A vaginal examination showed that the fundus of the uterus reached nearly to the umbilicus, the whole organ being enlarged by a fibrous tumor, a portion of which was projecting into the vagina and had the appearance of beginning to slough.

She was flowing at the time of admission and was ordered to take gallic acid and cinnamon water, which she did with a good result. Extra diet, etc., ordered.

April 7. Began giving thirty minims of the fluid extract of ergot by hypodermic injection.

April 8. The ergot had but little or no effect. The uterine contractions taking place about half an hour after the ergot had been given, and then after continuing about five minutes they would cease.

This morning and also at noon six grains of ergotine were given with but slight effect. The patient was etherized at 2 P. M. The sound was then passed up eight inches to the fundus, along the anterior wall, showing that the attachment of the tumor was to the posterior wall. The os was sufficiently dilated to allow of the escape of a portion of the tumor, about four inches in diameter.

Dr. Emmet began the operation by steady traction upon the presenting portion, while an assistant made pressure on the fundus above. After a large portion had been drawn down into the vagina it was cut off with a pair of scissors; another portion was then seized and brought down, until at length the whole was removed after a continuous labor of three hours.

During the operation Dr. Emmet was careful to make traction chiefly on that portion only which projected into the canal. He thus kept as far as possible from the attached portion so that when the time came for its expulsion the uterus would follow it up closely, and thus prevent hemorrhage.

Several times during the operation the uterus failed to keep up a continuous contraction so that some blood was lost.

Hot water was several times injected into the cavity of the uterus, with the effect of causing instantaneous contraction, and temporarily arresting the bleeding. After the whole tumor, as it was supposed, had been removed, an injection was given to wash out the canal. The effect was again to bring on marked contractions, causing a piece of the tumor as large as an orange to be forced from its bed, and presented at the os. This was removed with a tenaculum, and the uterus at once contracted to about five inches in depth, so that the fundus could just be reached with the finger. The lining membrane of the canal was found smooth, and when the patient was placed on the side, with a speculum in the usual position, the interior of the uterus was fully exposed by placing another speculum within the cavity, and under the arch of the pubes.

The interior of the uterus was thoroughly painted with Churchill's tincture of iodine. A strip of cotton saturated with glycerine was left in the canal, projecting from the os, and the patient was then put to bed with vessels of hot water about her. She had become very much prostrated from shock, and a drachm of brandy was given hypodermically before the operation was completed.

April 10. Passed rather a comfortable night, but vomited occasionally, and when she did so a thin watery discharge would escape from the vagina. At 9 A. M. the pulse was 120, the number of respirations 32, and the temperature 101¾° in the mouth. 2 P. M., P. 148, T. 100¼°. Thirty minims of the liq. opii comp. was given by the rectum, as she was unable to sleep. 7 P. M., P. 140, R. 32, T. 102½°. The tampon was removed and a hot-water vaginal and uterine injection administered. 9 P. M., P. 140, T. 102¼°. The liq. opii comp. was repeated by the rectum. During the day, brandy had been administered regularly by the mouth. At midnight she began to sink, and brandy was given hypodermically. The same was repeated at 4 A. M. Afterwards the spts. am. aromat. was administered by the same method, and the inhalation of the nitrate of amyl resorted to. She gradually sank and died at 7.30 A. M.

Afternoon the post-mortem examination was made. The uterus was removed and measured eight inches in length by four inches wide. On laying open the canal the tissues were found pale, but the mucous membrane was covered with a dark bloody secretion, in appearance not unlike that found in a uterus after a recent labor. At no point were the walls of the uterus less than a quarter of an inch in thickness. A small portion of the tumor, about an inch in diameter, was found in the right horn of the uterus, and but slightly adherent. There was also a small fragment still adherent on the left side near the internal os, but otherwise the interior surface was smooth, and the tumor had been entirely removed.

From the flabby appearance of the uterus it was evident that it had become relaxed, and increased somewhat in size after the operation. The portion of tumor found in the right cornu of the uterus was an off-shoot which had been cut across while still buried in the tissues, but became nearly detached by the last uterine contractions. The other portion near the internal os simply indicated where the last attachment or pedicle of the tumor had been cut across.

If we had no other evidence, the appearance of the uterus in this case would have been sufficient to demonstrate fully that such a tumor can be removed from the tissues of the uterus, by the method described, without injury to the organ. Although this poor woman died, the operation in her case was but a forlorn hope after the great loss of time. The result would have been very different had she possessed even a moderate degree of strength to aid in bringing about a reaction. The operation itself was a complete success in demonstrating the principle which could be applied in other cases.

I have removed, by traction at least, five or six tumors larger than the one in this case, and a number of smaller ones, and but two deaths have occurred. That we may learn more from the failures than from the successes, I have reported at the greater length these two cases where death occurred.

When we can make traction, it matters little how thin the outer wall of the uterus may be, provided we are able to excite the muscular tissue to contraction, since the space will be closed up as rapidly as the mass is withdrawn. This will surely be the case when we have a single tumor, especially if it be situated near the fundus or even in the lateral wall, if its size be not so large as to have replaced the greater portion of the true uterine tissue. There is certainly a limit to the procedure, but it is safer than enucleation, and is applicable to every case where a prudent operator would feel justified in attempting enucleation. I deprecate any effort to enucleate such a tumor, from the fact that we cannot know how far the uterine tissue may have become involved. Should the uterine wall have become too thin to contract properly, death from hemorrhage would occur before the operation could be completed. Where muscular action is not excited sufficiently, or to so limited an extent as to leave a large cavity, as is frequently the case after a tumor has been enucleated, the danger is equally great of death from blood poisoning. The question of enucleation for small fibroids has no connection here, since the circumstances are entirely different.

I recommend as a principle of practice to delay all surgical interference as long as possible. But so soon as the tumor presents at the os, and this begins to dilate, we then have proof that a reasonable amount of uterine muscular tissue remains to aid us. It then becomes a question of judgment as to the time and mode of administering ergot. As soon as the vagina is occupied by a portion of the tumor, the operation for its removal cannot be long delayed, for it becomes then a question of but a few hours, as a rule, before blood-poisoning may supervene.

Whenever the operation has been once commenced, there is but one course to follow, in removing the entire tumor, as the one attended with the least evil and risk to the patient. Whenever the tumor can be forced out by uterine contraction as rapidly as it can be removed at the vaginal cut, the operation will be attended with but little risk of life. In my experience, so far, there has been no greater disturbance than that attending any ordinary case of instrument labor whenever the tumor has been brought down to a pedicle and then divided. Our purpose is at first to excite uterine contraction by traction on the tumor, and this stimulant is maintained as it is being removed piece by piece from the vagina. So that from the commencement of the operation until the tumor has become pedunculated, the process simulates a perfectly natural one, and we have been but aiding nature. As there is no fear from hemorrhage, since the supply of blood is cut off as soon as the uterus begins to contract, our best means for removing the tumor is by a pair of blunt-pointed scissors, curved somewhat on the flat side. The écraseur, I have found, is not well fitted for the purpose, as it does not excite the uterus to the proper amount of contraction, nor can we remove the mass with it as rapidly as with scissors. The operation is best begun by passing a slip-knot high up around the mass, which is to be held by an assistant, to steady the uterus and for making traction. After having removed the portion which first filled the vagina, it is best to follow afterwards, as far as possible, the course of the uterine canal. The advantage is twofold, since the portion projecting into the canal, with the capsule-like covering, is firmer, and by removing first the tumor at the most distant point, the line of attachment becomes narrowed as the uterine cavity can be lessened.

A few words in relation to the after-treatment. When the tumor has been removed, with all shreds or loose portions within reach, it is important to wash out the cavity thoroughly. It is best to use very hot water, for it is a prompt exciter of uterine action, and by prolonging the injection we can thoroughly empty all the capillaries within reach of its direct influence. After the injection we possess no better

[illegible]

[illegible] the treatment of [illegible] Philadelphia [illegible] ordinary methods [illegible] the vagina, if possible [illegible] this purpose was [illegible] of Montreal, in one case; [illegible] cases; next by Professor [illegible] last year, 1877, by Dr. Goodell. [illegible] were successful, the symptoms [illegible] being wholly relieved, and

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[illegible] the Womb, Am. Journ. Med. Sci., July, [illegible] the fibroids themselves shrunk away, as they sometimes naturally do after the menopause. The idea is that as the sexual and periodic congestions of the womb feed the fibroids, render them painful, and increase the hemorrhage from them, these symptoms and the fibroids themselves ought to disappear when the ovarian influence which causes the congestions is destroyed. Further experience is requisite to establish the real value of the procedure.

CHAPTER XXX.

DISEASES OF THE EXTERNAL ORGANS OF GENERATION, CERVIX, AND UTERINE CANAL.

Elephantiasis and hypertrophy of labia and clitoris—Fibrous and fatty tumors—Oozing tumor—Labial cysts—Vaginismus—Vaginitis—Disease of the cervix and uterine canal.

THESE are chiefly cancerous growths, from the mucous membrane and deeper tissues; interstitial growths; and diseases of the mucous membrane. Having already treated of cancerous growths, so far as anything could be advanced of special and practical interest, we need not refer again to them.

We shall first treat of elephantiasis and simple enlargement of the labia, nymphæ, and clitoris, fibrous and fatty tumors, cystic growths, and oozing tumor.

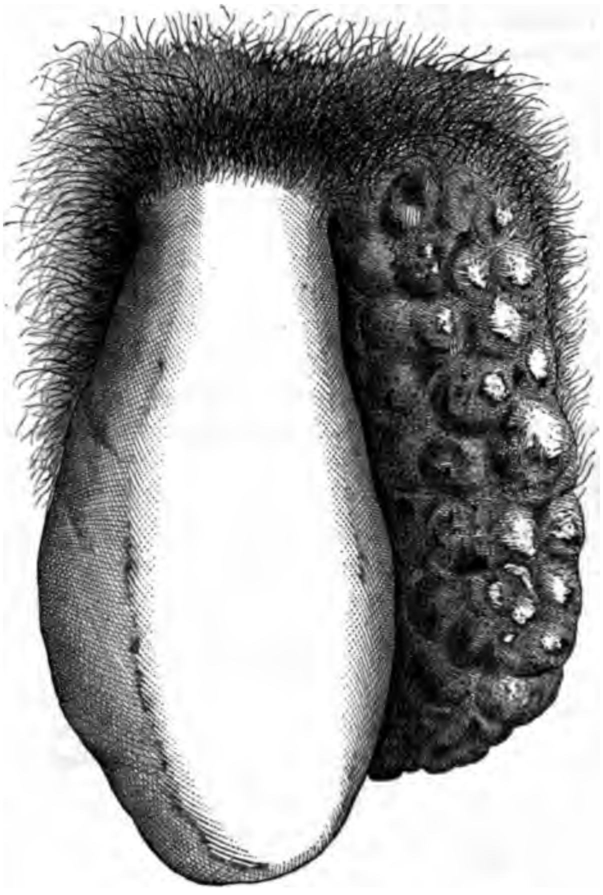
Elephantiasis of the labia is a very rare lesion in this country. In the East, where it is quite common, much doubt yet exists as to its exciting cause. The surface is rough, hard, and dry, and has little resemblance to healthy skin. Virchow regarded the disease as originating in the lymphatic glands, the connective tissue becoming hypertrophied and papillæ springing up on the surface. The rapidity of growth is not uniform in all parts of the mass, and that which develops first projects and gives an irregular appearance to the surface.

I have seen but one instance of this disease, or rather, I should say, but one in which there was a near approach to such a condition, so far as I could judge.

CASE XLI.—A woman, from the western part of New York, consulted me in April, 1866, for a tumor about the vulva. She was twenty-five years of age, had been two years married, and was sterile. She stated that when between sixteen and seventeen years old she noticed a swelling first in the left labium, which gradually increased in size. It occasionally felt sore, but never really painful. When first married she suffered a great deal at every sexual intercourse, but she ultimately learned that if she turned the loose tumor up towards her stomach no pain accompanied this act.

The left labium and clitoris were enlarged to about the size represented in the wood-cut, Fig. 102, which is from a rough sketch made by me at the time. The right labium and nymphæ were in a healthy condition, but the nymphæ on the left side had disappeared. The diseased labium was rough, hard, and like a piece of sole leather, while the enlarged clitoris was smooth and not unlike a fibro-cystic polypus in density. The uterus was enlarged, retroverted, and fixed from old cellular inflammation. The cervix was just within the vulva, and a fair depth to the vagina had been gained by stretching the posterior cul-de-sac. The position of the uterus was doubtless the cause of her sterility. She had grown exceedingly nervous since marriage, was losing flesh, and had a cough, but no disease of the air passages could be detected, except an old follicular inflammation in the pharynx.

Fig. 102.



Elephantiasis of the labium and hypertrophied clitoris.

I advised an operation, and she returned home to consult her husband; he was, however, unwilling to have her leave home, and nothing was done. When about writing this chapter, eleven years later, I wrote to her physician for her after-history, and learned directly from the woman herself that there had been little increase in size in the growth, and that her general health still remained impaired.

General hypertrophy of the labia and nymphæ occurs from inflammation, as the most common cause. I have seen the nymphæ enormously enlarged in several instances, and occasionally so much so as to cause irritation of the bladder, by dragging on the urethra. The nymphæ are easily removed with scissors, and if any unusual bleeding should occur it can be controlled by a compress of damp cotton over the bleeding surface, kept in place by a sufficiently large glass vaginal [illegible]. When this instrument is used the compresses need not be disturbed until loosened by suppuration. The catheter can be introduced [illegible] difficulty while the plug is in place, and at the same [illegible] itself will continue to exert pressure under the sym[illegible] from the internal pudic artery which supplies [illegible] seen but a single instance of simple hyper[illegible] extent demanding surgical interference.

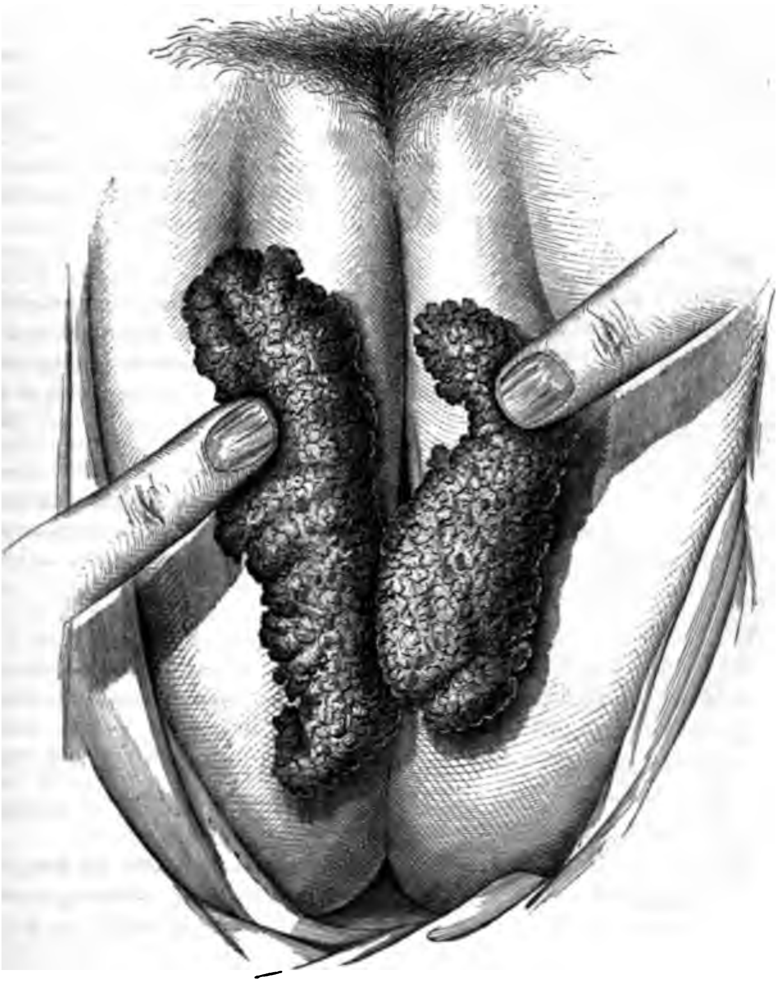
[illegible] woman was about 47 years of age, and had [illegible] I operated, removing both labia, one [illegible] and the other two, pounds. The edges were [illegible] silver sutures, and union followed by [illegible] have been no apparent local cause [illegible] simply as an instance of excess of [illegible] the disease.

[illegible] sometimes develop in the labia to an [illegible] the soft parts they become pedun[illegible] their attachment become [illegible]

[illegible] ago I was consulted by a rather [illegible] a growth on the left labium. [illegible] her waist. The tumor was [illegible] state with any certainty the [illegible] fatty tumor, between six and [illegible] flattened to about four inches [illegible] but very thin, and had been [illegible] to the knee. As she lay [illegible] the tumor rested between [illegible] with great interest, with a [illegible] suddenly she accosted me [illegible] "And is it cancer, Doctor?" [illegible] that it is not," was my answer. "I [illegible] that is just what I wanted to know." [illegible] without further delay. I tried to im[illegible] that I had been hasty, and after all that cancer might appear at her time of life, but without any effect, for she would not even allow me another examination, that I might take a sketch of the growth.

Oozing Tumor of the Labia.—This is an irregular papillary, or cauliflower-like, growth springing from one or both labia, the prominent feature being a profuse acrid and watery discharge, which is exceedingly offensive. It is supposed to be due to a want of cleanliness, and may occur at any age. Those, however, who have described the disease state it to be one of middle life, most common with the fat,

Fig. 103.



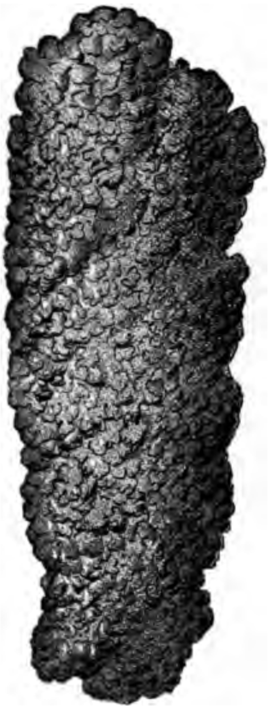
Oozing tumor of the labia.

and with those who have borne children. I have had but two cases under observation. One was a young girl, whose history I will detail, and the other was a young woman, about twenty-three, who had never been pregnant. In both instances I amputated the labia.

CASE XLIV.—M. E. S., aged 16, was admitted to the Woman's Hospital, from Oswego Co., N. Y., Jan. 18, 1876. Menstruated first at twelve; became regular, and flow lasted four days; but her general health was never very good. Three months previous to admission she noticed something growing about the vulva. This growth had rapidly increased, being accompanied by a very disagreeable discharge; i bled readily, but was free from pain.

I found the labia entirely covered by a growth, with the excepti of a small portion at the upper part, which was very much swolle This growth resembled cauliflower excrescence somewhat, and e tended a little beyond the anus. It was about an inch and a half width at the widest part, and an inch depth (see Fig. 104). On rolling out th parts it was found to extend within but short distance upon the mucous membrane. Under the cut edges of the mass were found several detached growths, springing from the skin. The growth could be separated by the fingers into distinct lobes, each springing from a separate pedicle, but branching out so as to present on the surface a continuous growth, like the fastigiate cymes of certain umbelliferous plants, and filling the whole space between the thighs. On a careful examination separate papillæ could be distinguished, about one-third of an inch in length, and all closely packed together. An attempt has been made in Fig. 105 to show the structure of this growth. Her general condition was poor, and she was found to be extremely anæmic. The odor was excessively fetid, annoying all about her in the ward. Much time was spent after her admission in keeping the parts as clean as possible, by frequent washings with a solution of carbolic acid in water.

Fig. 104.



Structure of oozing tumor.

Jan. 25. She was etherized for the purpose of being operated on. Fearing excessive hemorrhage, I took a section of silver wire, and attaching a straight needle directly to each end of the wire, the tumor being lifted up from the parts below by an assistant, I passed each needle in opposite directions, side by side, along the same tract, making a shoemaker's stitch. This was done at intervals of one inch. The left labium was then rapidly cut away, with a pair of scissors, well into the healthy tissue. The sutures controlled the bleeding to a great extent, but it was necessary to tie several arteries, and as this involved the removal of several of the sutures to admit of the ligatures being tied, some hemorrhage followed. This determined me to remove the other labium in a different manner. Beginning from above, I cut through, with a knife, about one-third of the part, then rapidly introduced the sutures so as to catch up the skin only, on opposite sides. These were then crossed by an assistant, and held down tight enough to bring the sides in contact. This plan was followed until I had removed the whole. Yet, notwithstanding the precaution, and the rapidity with which the operation was advanced, the loss of blood was very great. Contrary to the rule, a number of arteries had to be tied, and the oozing was troublesome. Eleven sutures were placed in the left, and sixteen in the right, labium. These sutures were bent over so as to lie flat on the skin, and under their edges was placed a narrow strip of greased linen. A linen compress was placed between the labia, so as to keep up pressure on each side, and over all a T bandage. The several detached points of growth were removed with scissors, and their base touched with the galvanic cautery, which at once stopped all bleeding.

There was nothing in the progress of the case to note until Feb. 1st, when the sutures were removed. There had been no pain, and but little discharge. It was found that the wound itself had healed throughout by first intention, but the course of several of the sutures was inflamed as if these sutures had been disturbed. After washing off the surface, by squeezing upon it tepid water from a sponge, a daily dressing was made of balsam of Peru spread on linen.

Feb. 10. Nearly all the surface had healed, except at two or three points, where the granulations were large, and these were touched with nitrate of silver. I then directed the parts to be kept dry by dusting oxide of zinc over them, and to dispense with all bandages, which were keeping the parts too warm.

March 1. The tract of two sutures had not yet healed, but after making two applications to them of strong carbolic acid, they closed in a few days.

From the date of her admission the greatest care was directed towards improving her general state, for she was very anæmic, and her appearance improved greatly after taking an old preparation of the tincture of the chloride of iron. The uterus was retroverted, and there was quite a vaginal discharge. The uterus was put in place, and a pessary fitted. Vaginal injections of warm water were freely used, some chloride of ammonium being added to each.

May 12. She was discharged cured, and a no less remarkable feature in her case was the rapidity with which all traces of the operation were disappearing.

Labial Cysts.—Mucous glands in a state of cystic degeneration, and dermoid cysts are sometimes found in the labia. The dermoid cysts are exceedingly rare. Those of the labial glands are formed by degeneration of the glands of Bartholini (also called glands of Duverney), which are situated on each side of the entrance to the vagina. These cysts may form either in the glands or in their excretory ducts, and are more frequently found on the left side. I have had six cases in private practice and three in the Woman's Hospital, of which eight were on the left and one on the right side. All the women were under thirty years of age, and the cysts were found among all classes, unmarried, sterile, and fruitful. They develop very slowly, are free from pain, and give no inconvenience beyond that which comes from their bulk. I have never seen one of these cysts enlarge beyond the size of a hen's egg, although they sometimes reach a much larger size.

[illegible]—As a cyst enlarges, it rolls out and exposes the more [illegible] covering the inner face of the vulva on that [illegible] distended with fluid, can be easily defined. [illegible] sometimes oval, and it might be possible, from a hasty [illegible] a loosely filled sac for an inguinal hernia. [illegible] down into the labium, and the patient [illegible] the mass is grasped with the hand, a corre- [illegible] transmitted. If it is a hernia, it can be [illegible] the mass will disappear, which of course could [illegible] a cyst. Then if it were an irreducible hernia [illegible] strangulated, the gut would always be sufficiently dis- [illegible] to give a clear sound on percussion. In fact, such [illegible] mistaken for anything else if ordinary care be exer- [illegible] examination.

[illegible] To bring about adhesive inflammation within the walls [illegible] and thus prevent its refilling, or to extirpate the whole [illegible] the only plans of treatment which can be followed with [illegible] certainty of success. Local applications or simply emptying the [illegible] its contents will be of no permanent benefit.

After evacuating the fluid, the cyst must be freely laid open, a thorough application of iodine made to its walls, and the cavity packed with oakum, which is to remain until suppuration is established. To insure the healing up from the bottom, the cavity must be frequently washed out by injections, and a pledget of oakum kept inserted to the bottom of the wound to secure thorough drainage. This plan will sometimes succeed, but as the outer wall of the cyst is [illegible] thinly covered by tissue, this portion of the labium may slough, [illegible] such a contingency the contraction would afterwards be very [illegible]rable.

When the cyst is punctured or extirpated, the parts should be first rolled out as much as possible, that the tumor may become more superficial. In this way we avoid a large plexus of vessels which lies in the labium, which would otherwise be directly in front, and the cicatrix which is to form will then be so far within the vaginal outlet as to be but little exposed to irritation.

For the removal of a cyst of this nature, the patient must be etherized, and placed on the back with the limbs flexed on the abdomen. Then, as the labium is everted by an assistant, the operator catches up the cyst between the thumb and forefinger, so as to put the parts covering the cyst on the stretch. An incision, some two inches long, must be made parallel to the course of the labia, and with great care, down on to the cyst. Then by tearing the tissues with the handle of a scalpel, and by snipping them with a pair of scissors, and by the proper amount of traction the attempt must be made to remove the cyst entire. It is rare that this can be done, for rupture and the escape of the contents of the cyst will readily take place. But care and a steady hand must be employed until a sufficient portion has been dissected out to serve as a guide for the removal of the whole.

Some of these cysts are thus removed without difficulty, while others extend so far within the pelvis that I have doubted their connection with the labial glands. The attachment of the last cyst of this kind which I removed extended to the periosteum on the inner face of the left ramus, and when it had all been removed a most formidable opening was left.

It is highly important that union by the first intention should be gained as far as possible. With this view, I introduce deep silver sutures from above downward, so as to bring the soft parts into apposition, if it can be done. When this is not practicable, I endeavor to gain what I can, but then leave always in the lower angle of the wound a little oakum, which must extend to the deepest portion of the wound, to insure the drainage of any accumulation of pus. Frequently all, or at least a large portion, will then heal by the first intention, and the sinus will close soon afterwards.

Vaginismus.—This subject is now presented without any special connection with the preceding, beyond having a common locality, and because it cannot well be classified elsewhere.

It is to be regarded purely as a symptom, denoting reflex irritation, of which the chief expression is an exaggerated sensitiveness about the hymen and vaginal outlet. As the irritation is transmitted through the sympathetic nerves, the effect is experienced at its terminal branches in the erectile tissue distributed about the entrance to the vagina.

It is found only in anæmic and excessively nervous women, and in those who have in some manner overtaxed their nervous systems. Their general condition renders them peculiarly liable to neuralgia, of which the symptom under consideration is but a kindred ailment. The locality is determined as if it were by accident, or by some law of which we are ignorant. It is an exception to find any local exciting cause; occasionally there may be some cicatricial tissue about the perineum or neck of the uterus, or some local inflammation or disease of the vagina, vulva, meatus, urethra, or vesical neck.

Vaginismus, which is the name—although an inaccurate one—given to this condition, was first recognized by Dr. Sims, in 1857, and in his work on Uterine Surgery it is described and treated as a distinct local lesion. My experience does not coincide with his, as I have never failed to find some condition, as a displacement, a limited cellulitis, a fissure in either the rectum or neck of the bladder as the exciting cause. But even when apparently due to a local inflammation, such as a discharge from the uterine canal, it will be found that treatment directed solely to removing this discharge will seldom relieve the vaginismus. By making a most thorough examination we will rarely fail to detect the remains of a cellulitis, between one or the other broad ligament, which obstruct the circulation to a greater or less extent, and cause the discharge. If a cellulitis exists or a displacement or a fissure, such condition must be treated. Frequently all three exist together, and they must all be removed, and some improvement made in the general condition, both morally and physically, before the vaginismus can be permanently cured.

Dr. Sims recommended the entire removal of the hymen with a pair of scissors, and the insertion of one of his vaginal glass plugs until the parts had healed. He directed the plug to be removed from time to time, and injections used, as after the operation for opening the vagina. After the parts had healed, the circular cicatrix, made by the previous operation, was freely divided at different points. He then made two incisions, across the course of the muscle, so that they came together, like the upper portion of the letter Y, and were then continued through the perineum as a single incision, until the vaginal outlet had been fully opened. The plug was again used until the parts had healed.

This operation sometimes gives a remarkable degree of relief accompanied by much improvement in the nervous symptoms, but I have found that the difficulty generally returns. In fact, I have never met with a permanent cure unless the exciting cause was sought out and removed. Where the vaginal entrance is unusually small, and the woman has not learned to exercise self-control, I am sometimes obliged to perform the operation, but never under other circumstances.

I generally give ether to ascertain at the beginning the cause of the difficulty. If due to a displacement, I attempt at once to correct it; if I find a fissure in the anus, I operate without delay by moderate dilatation, bringing the parts well into view and completing the operation by drawing a knife through the tract of the ulcer. If I find the remains of cellulitis, and there is nothing urgent, I simply put the vaginal outlet thoroughly on the stretch at the completion of the examination. I direct hot vaginal injections of water to be given night and morning as the only local treatment. The bowels are carefully regulated, and every attention given to improving the general condition. Sun-baths are to be used, more fresh air obtained, and some congenial occupation, involving moderate exercise, must be found to engage the time of the patient. One of the first steps towards her cure will be to get her away, temporarily at least, from the exciting cause of irritation to her nervous system: this is frequently her husband.

There is a certain condition which is almost always accompanied by a moderate cellulitis in one of the broad ligaments, rendering the female devoid of all sexual desire. For a time, woman-like, she will submit to marital approaches through a sense of duty, but, after a while, by degrees, their suggestion even excites a feeling of disgust. If she continues to submit to what she supposes she is obliged to do, this hyperæsthesia and spasm become finally developed as an earnest of the disgust, in the same manner as the gullet closes spontaneously against, and rejects a nauseous draught. If the necessary treatment can be administered by degrees, this condition will disappear without an operation, and the woman will return to her duties as a wife with very different feelings.

When the operation has to be done, I perform it in a manner differing somewhat from that practised by Dr. Sims. The patient is placed on the back with the limbs drawn up; after etherization, a speculum is introduced under the arch of the pubis, so as to bring the posterior wall of the vagina into view. The index finger is inserted within the anus and the sphincter is pressed up against the posterior wall of the vagina. It is then easy to divide with scissors the fibres encircling the vagina on each side, just within the fourchette, and about three-quarters of an inch apart. This does not allow a prolapse of the vaginal wall, as when the perineum is lacerated, but does permit of an equal extent of dilatation of the outlet by the glass plug.

Vaginitis.—Inflammation of the mucous membrane due to venereal diseases will not be treated of, nor will cancerous growths be again considered under this head, but only the effects of cold or injury, and benign growths in the vagina and uterine canal.

Inflammation of the mucous membrane covering the cervix, vagina, and vulva, is a very common result of cold and local injury. Exposure to cold will cause inflammation in the cervical mucous follicles, which may in time subside, or leave the woman liable to relapse. It will often happen that a circumscribed and unsuspected attack of cellulitis has been contracted at the same exposure. Certain changes may afterwards take place in the circulation of the cellular tissue, so that one condition will react on the other, particularly if the exposure to cold or the over-exertion has been excessive.

Repeated attacks of inflammation of the lining membrane of the vagina and that covering the labia may be excited by a similar condition in the cervical canal, and may entirely disappear, but the products of each attack of inflammation will remain within the cervix ready to set up a fresh development. This condition of the cervix is commonly termed chronic inflammation, in regard to which my views have been fully expressed in a previous chapter. I do not believe that such a pathological state can exist. After an attack of inflammation, its products are easily recognized, and chiefly there is manifest such a change in the condition of the bloodvessels as leads to increased secretion. The retention of a portion of this secretion within so confined a space, may in turn react on the mucous follicles and thus keep up a diseased action which would disappear sometimes, as in the vagina, by resolution, if the condition and environment were different.

The same may be true regarding the lining membrane of the Fallopian tubes. When inflammation has been once produced in them by cold or gonorrhœa, it never subsides during the generative life of the ovaries, but leads to sterility and other troubles. This condition of inflammation has been termed salpingitis, and after this mention I will not again refer to it, since we have no means of recognizing its existence or its products until after death.

Many opinions have been advanced as to the cause of inflammation of the vaginal mucous membrane.

It occurs as gonorrhœa, a subject, however, which the scope of this work does not embrace. It doubtless is also produced by exposure, want of cleanliness, and the presence of pediculi, and it is said that certain conditions of the urine, like in diabetes, will keep up the irritation.

But, for our purpose, the condition may be regarded as the direct result of poisoning from some uterine discharge. This discharge frequently does not become irritating until it reaches the vaginal outlet and is exposed to the action of the air. The inflammation is then first established on the vulva, from which it extends to the external organs and within the vagina.

Some women suffer from this malady after any unusual exertion, after sexual intercourse, and after each menstrual period, but it disappears often in a short time, without leaving a trace.

A severe attack will be ushered in by a chill and fever, a feeling of great heat and fulness in the vagina, back-ache, irritation of the bladder and itching, some relief as to the more urgent symptoms following as soon as the discharge becomes established. The disease will then gradually subside, or, as I have known in several instances, the vaginitis, when at its height will suddenly disappear, as by metastasis, on the advent of an attack of cellulitis or peritonitis.

But the cases which we meet with most frequently in practice will not be of so serious a character. Yet few diseases to which women are specially subject, are attended with more continued suffering and annoyance than this one.

The pruritus, or itching, will often be intolerable, and is made worse as soon as the woman becomes warm in bed, and is unable to resist seeking the momentary relief which scratching and tearing her person will afford. I know of nothing which is so calculated to induce insanity as an attack of pruritus; for often until the disease has run a certain course, nothing apparently relieves it, except an anæsthetic.

I have had several cases under my care which gave me much concern on account of the critical condition due to loss of sleep, and the exhaustion from want of nourishment.

A vaginal examination will rarely show a condition sufficient to account for the suffering. There will be found a more profuse cervical discharge than usual, the mucous membrane of the vagina will be of a natural color within the passage, but becoming red and dry as it blends with that covering the outlet, which will always be the more inflamed. But occasionally the whole lining membrane of the passage and external organs will be inflamed. The parts will be thrown into folds, and the papillæ prominent, so as to have a deep red and congested appearance of the mucous membrane. At first there will be an absence of secretion, and the parts hot and swollen, but at a later stage the secretion of pus may be profuse. The case may be still further complicated by the formation of an abscess in the deeper tissues of the labia. But between the two extremes we will find every shade in the degree of inflammation.

Treatment.—A thorough injection of warm water must be first given, a speculum introduced, and the parts dried. If very much inflamed, the parts can be best dried by applying a piece of soft lint pressed over them. Under ordinary circumstances a soft sponge will answer, but it should never be used for another case. The greatest cleanliness of person and instruments should be observed, for there is no question of the communicability of this poison from one woman to another by means of the discharge. It can be, and is frequently, thus transmitted through carelessness on the part of the physician or the nurse.

As the patient lies on the side, with the vagina fully exposed by a speculum, a solution of nitrate of silver must be applied within the cervical canal, and over every portion of the vaginal mucous membrane and outlet. A solution of forty grains to the ounce of water is the strength I generally use. For the uterine canal the applicator will have to be employed, but for the vagina and outlet a small sponge probang or a portion of cotton twisted around the end of the swab stick is best. It is the best plan to pour out a small quantity into a shallow vessel, into which the probang may be dipped from time to time, and the solution applied until the whole surface becomes whitened. After this the speculum is withdrawn, the patient on the back, and some cotton packed into the sulcus, below the perineum, to protect the clothing. Then, as an assistant exposes the inner face of the vulva, by pressure of a hand on each side, the same application must be thoroughly made to it. Whenever the inflammation has extended to the parts covered with hair, it may be necessary to shave them.

As soon as the parts have dried they are to be freely covered with zinc ointment or vaseline, and a soft piece of linen, about three inches long, and as wide, must be laid between the labia, and pushed sufficiently within the vagina to be held in place. Afterwards the patient must be put to bed. The application of nitrate of silver will cause but little pain after a few moments; in fact, if it should cause pain this will add nothing to the distress, since it brings relief from the itching. Before bedtime an injection of hot water must be administered, containing a teaspoonful of chloride of ammonium to each pint. Either borax, bicarbonate of soda, or chlorate of potash may be used for the same purpose, although neither is so efficacious. After the injection the ointment must be again freely applied. These injections must be administered two or three times a day, the patient's hips being elevated for the purpose. On the following morning after the injection has been given, a mass of cotton or oakum, thoroughly saturated with glycerine, must be placed in the vagina. To the glycerine should be added a few drops of impure carbolic acid, and the dressing must be smoothly spread out along the length of the vagina, so as to keep the walls of the passage from coming together. After each injection a fresh dressing must be placed within the vagina. Should there be much heat and swelling a few spoonfuls of alcohol can be added to the injection, which, with the chloride of ammonium, will hasten the evaporation, and by this means lower the temperature. If the case happens to be a mild one, the application of the impure carbolic acid will answer perfectly well. Glycerine is invaluable as a disinfectant, and for reducing capillary congestion through its greed for moisture.

The strength of the nitrate of silver solution must be increased according to the severity of the case, and at some special point it may even be sometimes necessary to resort to the solid stick. These applications frequently have to be repeated in four or five days, if a decided relief has not been gained.

Some severe forms of this disease are relieved by filling the vagina and covering the external parts with a thin paste, or poultice, made of fuller's earth, over which a napkin is to be placed for protection, in the same manner as for an infant. A little glycerine, added to the water with which the fuller's earth is mixed, will prevent its drying rapidly. As it begins to get dry and irritating it is to be removed from the vagina by means of an injection, and that from the labia must be washed off with a jet from the syringe, and not wiped away by a cloth. I suppose that a mud poultice, made from any earth which has been reduced to an impalpable powder, would answer the same purpose. I happened to use fuller's earth, the *Cimolia purpurescens*, from my knowledge of it as an old woman's remedy for "taking the heat out" of an inflamed breast or nipple.

The disinfecting and deodorizing properties of common earth, and its power, when damp, of lowering the temperature of an inflamed surface, has long been known to the surgeon.

Until the patient has been greatly relieved she should remain i the recumbent position, with her hips somewhat elevated.

One of the first steps in the treatment of this condition should be effect a proper action of the bowels by a prompt saline cathartic. the bowels have been sluggish a dose of calomel and soda will pro useful in relieving the portal circulation, so that the pelvic vess may become less charged with blood. The patient should, if nec sary, have an anodyne to overcome excessive pain or sleeplessness

As a local application a small quantity of chloroform may be rub into an emulsion, or mixed with simple cold cream spread upo cloth, and applied between the labia. As an anodyne Dover's pow is preferable, when it can be retained, and to it, at night, three five grains of quinine may be added.

Should an abscess result from this inflammation, it should be poulticed, and opened as soon as fluctuation can be detected, in order to prevent the burrowing of the pus. The point of puncture should be made well within the vaginal outlet, for the reasons given when describing the operation for removing labial cysts. It will be necessary also to give some attention to the general condition, not only because the patient's strength is always impaired, but because any improvement in it will hasten the healing of the abscess.

Certain Conditions of the Mucous Membrane covering the Cervix and of the Membrane lining the Uterine Canal.—The structure proper of the cervix is dense, and contains but few bloodvessels or nerves in comparison with the other portions of the uterus. But its surface is covered with erectile tissue continued from the vaginal walls, and this is freely supplied with bloodvessels and with nerve fibres from the sympathetic system. It is through the medium of these nerves, that morbid processes in the cervix, by reflex action, may cause a serious impairment of health, and even establish diseases in remote parts of the body. It has been already stated that the sympathetic presides over nutrition through life, and over the organs of generation during the period of their activity.

As a consequence of this close relation, it is evident that the general nutrition must soon suffer if a condition long exists in the generative organs from which morbid reflex irritations can emanate. The presence of cicatricial and dense tissue in the cervix will sooner or later excite this. If the mucous follicles become inflamed, undergo cystic degeneration, and are at length destroyed, phthisis so often results, that the relation of cause and effect cannot be doubted. When the character of the mucous membrane covering the cervix has been destroyed, either by inflammation or by the continued application of some remedy to heal an erosion, the deeper tissues become dense and undergo atrophy.

To the destruction or change in character of the mucous membrane covering the cervix is due much of the anæmia and neuralgia of women.

I do not claim that the general health of every woman who has a scar on the cervix will suffer, or that she will always have neuralgia in consequence. But it has been demonstrated to my mind as clearly as anything we accept as truth in medicine, that there exist a relation of cause and effect under the following circumstances. If a woman receives an injury in labor, as a laceration of the cervix, and is in such perfect health as to be able to withstand the irritation, she may go for an indefinite time without suffering any evil consequences. But if she should ever become anæmic, and the victim of neuralgia, with this condition of the cervix, she will not recover her health until the source of irritation has been removed by the surgeon, or by nature after she has gone through a change of life.

Twenty-five years ago or more, it was the practice to apply nitrate of silver to the cervix for almost every condition, real or imaginary. It was then rare to find a woman who had been so treated, whose cervix uteri was not hardened to an extreme degree.

These women were as a rule martyrs to neuralgia, and were as commonly anæmic. Many became addicted to the use of opium, and not one obtained relief unless the cervix was amputated, or they lived until a change was brought about after the menopause. Let me remind the reader than I am not advocating amputation of the cervix, by which the surface would be left to heal by cicatrization. There are special objections to the presence of cicatricial tissue, which have been already treated of, but not in this connection. Here the difficulty lies not so much in the character of the tissue as in the fact that the fibres of the sympathetic become involved in the contraction.

But to return to our subject: Now that a certain time has elapsed since this practice has gone into disuse, it is as rare to find a woman suffering to the same extent as it formerly was to meet with one who had no suffering. Anæmia is no less common, for we have not yet removed all the causes which impair the nutritive glands. But my case-books demonstrate the fact that for every woman which I am now called upon to treat for neuralgia I had five under my care fifteen or sixteen years ago, when I began to study this condition.

So much has already been advanced on this subject in different parts of this work, that it cannot be dwelt upon at much greater length without repetition. The various lesions of the cervix which result from childbirth, and become reflex sources of disease, have also been fully treated of elsewhere, and my chief purpose in referring again to these morbid conditions is in reference to certain affections of the mucous follicles within the canal.

The exaggerated action of these glands, and the frequent recurrence of inflammation in them, are so often dependent on a diseased condition of the connective tissue of the pelvis, that it is to be suspected in every case. Sufficient has also been stated regarding the treatment of erosions which follow upon this increase of secretion, and no further allusion to them need be made here.

Single Nabothian follicles sometimes become inflamed and reach a large size, so that they can be easily felt with a probe projecting at some distance into the canal. These growths always excite a great deal of local irritation, and cause an increase of secretion. The most effective method of removing them is to clip them off with a pair of scissors, after first catching up the mass with a tenaculum, which may also serve as a guide. If necessary to facilitate their removal, the canal should be dilated, and afterwards a free application of iodine should be made to the denuded surface.

Whenever the follicles undergo cystic degeneration, they should be punctured so as to relieve the pressure they exert on others in their neighborhood. The formation of these cysts frequently excites a great deal of nervous disturbance, and fully illustrates the effects of pressure on the sympathetic fibres. It is seldom that I have not had some patient under my care suffering from this cause, and they often return to me at long intervals, recognizing from their feelings the necessity for having the cysts punctured. I have a lady under my care at present who is so sensitive that as soon as a single cyst develops she immediately returns for relief. I have seen her about once in six months during the past five years, and she has not been mistaken upon any occasion as to the cause of her pain.

When within the canal they cannot be so readily reached, and when detected, from the rough surface presented by them, they are best ruptured by means of Thomas's dull wire curette drawn over their surface with some degree of pressure.

These follicular growths sometimes undergo development into the ordinary mucous polypus, from which the loss of blood is generally excessive. They are occasionally found in young women, but, as a rule, they are developed in middle life, or as the woman approaches the menopause. After a change of life has taken place, and the cervix has disappeared, these growths are found hanging free in the vagina. So long as they remain within the uterine canal they are a source of irritation which leads to hemorrhages; but when they hang free in the vagina, the tendency to a loss of blood ceases, and they no longer cause any irritation. There is a stage, however, in the growth when the polypus protrudes just enough to close the os and cause a retention of the secretions within the uterus. When this discharge, already partially decomposed, escapes by degrees into the vagina, its presence often causes itching, and sometimes keeps up a vaginitis. This form of polypus will, as a rule, be found presenting at the os if the examination be made just at the close of menstruation. If there is bleeding from the uterus, and no particular cause can be detected, it is always the proper treatment, as a first step, to dilate the canal.

When brought into view this growth is, in appearance, not unlike a mass of tenacious mucus saturated with blood, and it bleeds on the slightest touch. If seized by a pair of smooth forceps, and drawn out, its pedicle can be traced with a probe to some distance within the canal. The natural impulse is to tear the growth away; this can be readily done, but if force be used an attack of cellulitis will be more likely to result than after the removal of a large pedunculated polypus.

There certainly exists a closer relation between the mucous membrane of the vagina, the uterine canal, and the peritoneum and connective tissue of the pelvis, than is generally supposed. I have had this accident several times occur from twisting off such a growth. I now always divide the pedicle close to its attachment with a pair of scissors as the mass is held on the stretch by forceps. After its removal an application of iodine should be made, but not until the canal has been syringed out with tepid water should a sponge tent be used. Although there may be no bleeding, it is always a prudent precaution to use a moderate tampon, and to keep the woman quiet in the recumbent position for a few hours after the operation.

Disease of the Lining Membrane of the Uterus.—We will now consider a condition of the lining membrane of the uterus which is exceedingly common, and but little understood. With women who have had a number of children, or who have miscarried frequently, certain changes take place which render them liable, not only to excessive menstruation, but sometimes to loss of blood in the interval. The uterus is always larger than natural, but not sufficiently so to indicate the presence of a fibroid or of any internal growth. The patient will date her disease from the birth of a child, or from a miscarriage, in which case the difficulty may be frequently traced to a small portion of placenta which has become so organized as to resemble an outgrowth from the uterine surface.

Microscopists have not yet, to my knowledge, fully investigated this subject, and I cannot speak with authority, but it is evident that there are several distinct conditions capable of giving rise to the same symptom. Practically, this fact is of little importance, since whatever the condition, or if two or more coexist, the treatment will be exactly the same.

We must bear in mind that the uterus has a mucous membrane only as far as the internal os, beyond which the lining membrane is an outgrowth, as it were, from the muscular tissue. It is, therefore, free from mucous follicles, and consequently it can be determined by the microscope whether the disease is located above or below the internal os.

A condition is frequently met which some writer has compared to the granulations of conjunctivitis. Again, large flabby granulations, or fungosities, may exist at several points in a mass together, which bleed on the slightest touch. The favorite site for these is in one or both cornua of the uterus, from which cause their presence is frequently overlooked.

A common form of outgrowth, found in the upper portion of the canal, resembles closely the long pile of velvet cloth, and when floated in water it seems to consist of prolongations of bloodvessels from the muscular tissue.

I have also noticed a thickened condition of the lining membrane, which could be easily detached in long strips, like the skin which has been scalded, and it is blanched in appearance. It seems as if it were soaked in water, or as if macerated from the constant flow of serum which generally accompanies the condition when there is no hemorrhage.

But one mode of treatment exists, viz., to remove the growths entirely, leaving a healthy surface exposed. The important point is the proper mode of doing so with the least risk to the patient. Récamier devised the curette for the removal of these growths, an instrument which has proved a most objectionable one. The same instrument has been modified by Simpson, Simon, and Sims, without removing the objectionable features. As regards the instrument of

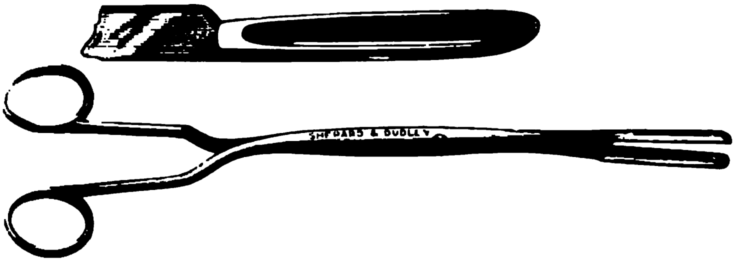
Dr. Sims, I honestly believe that the ingenuity of man has never devised one capable of doing more injury and as little good.

Women suffering from these growths are all exceedingly anæmic from the long loss of blood during menstruation, and from the leakage of serum which has continued in the interval. A woman with anæmia is always very susceptible to blood-poisoning after an operation for this condition, and peritonitis is likewise not an infrequent sequel. I have known peritonitis, cellulitis, pelvic abscess, and even death, to occur on removing these growths from the uterine canal with a curette, and in every instance the operator was dexterous in the use of the instrument. My views are based on a dearly bought experience, and I believe that no man has a right to place the life of his patient in jeopardy by the use of either of these instruments in the treatment of this condition. Their use should be limited to the removal of malignant disease, under certain circumstances, and then only with the greatest care, for the walls of the uterus have been perforated by them.

These growths are difficult to find, and it is rare that they can be detected by use of the sound or probe, and if the canal be dilated to any extent by means of a sponge tent, they become so compressed that the finger cannot appreciate their presence, and consequently the physician is frequently misled. The use of the curette is certainly a great aid for establishing a diagnosis, but unfortunately it removes both healthy and unhealthy tissue. The copper wire loop devised by Dr. T. G. Thomas is a safe, and, as a rule, an efficient means for the removal of these growths. It is an excellent instrument for use in the condition where the membrane is thickened, and there is nothing to be brought away. By drawing the loop with some pressure over this surface, so great a modifying effect is established in the nutrition of the parts that it seldoms fails to arrest the tendency to bleeding. It is also as effective in breaking up the soft villous growths, but not so good for granulations of a firm consistency. For more particular information as to the use of the dull wire curette, and its applicability in the diseases of the uterine canal, the reader is referred to Dr. P. F. Mundé's admirable papers in the Edinburgh Medical Journal for March and April, 1878.

I have for many years realized the danger attending the use of Sims's curette, and have devised another instrument which has proved efficacious, and its use is singularly free from bad consequences. I began with a pair of forceps made for other purposes, and modified them into the present shape, which has remained unchanged for the [illegible] had the blades constructed in shape like two of [illegible] coming together so that a cross section of the two, [illegible] would be not unlike the figure 8 (see Fig. 105). The [illegible] advantage of the instrument is that it can remove only what [illegible] above the common level. This it crushes off sufficiently close [illegible] dragging upon or injuring the surrounding tissues.

Fig. 105.



Emmet's curette forceps.

The proper mode of operating is to place the patient on the left side, and the speculum is used. There is so little pain attending the procedure that scarcely a necessity exists for an anæsthetic, but my rule is to administer one, for it has given me better results, and I believe that it does much towards protecting the patient. It also gives the operator greater facility by relaxing the parts, and affords him more time for the thorough removal of the growths than he would have if he were anxious to terminate the operation on account of the emotions of the patient.

As a rule, in these cases the canal is sufficiently open to admit of the passage of the curette forceps, but if further dilatation be required, the judicious use of the forceps themselves will frequently accomplish it. When a sponge tent is used, it should not be a large one nor long enough to reach to the fundus. It is only necessary to dilate as far as the internal os, and too long a tent should not be used. Sometimes a large tent is a most efficient means for destroying these growths, as shown by the history of a case detailed in one of the early chapters of this work, but since the pressure must be kept up for several days, it is attended with considerable risk of blood poisoning.

Before introducing the forceps the uterus must be gently drawn down near the outlet, by means of a tenaculum caught in the anterior lip. When brought within range, so that the fundus presents in the direction of the promontory of the sacrum, it will be easy to introduce the forceps without employing much force. They are to be dipped in warm water, and slightly smeared with glycerine, before being passed up into one or the other cornu. When the extremity of the instrument has reached the desired point, its jaws are to be gently separated, then closed firmly together, and withdrawn. By shaking the end of the instrument in a basin of water, anything which has been brought away will be easily dislodged. The operator can thus systematically pass over the whole surface, and without exerting the slightest violence. When satisfied that there remains nothing more to be removed, the canal must be gently washed out by means of a long-nozzled hard-rubber syringe. This will be the most efficient means for guarding against the occurrence of blood-poisoning by removal of all the débris. Then a free application of iodine to the fundus must be made to excite contraction of the uterus, by which the quantity of blood circulating in the organ will be diminished. A small tampon of cotton, saturated with glycerine, should be introduced, and then, under all circumstances, the patient must be kept in bed for several days, as a matter of ordinary caution. Vaginal injections of warm water must be administered freely, night and morning, for a week, even if there should be no discharge.

In anticipation of the next menstrual period, the patient is to be kept in bed for the twenty-four hours before it makes its appearance, and the horizontal position is to be maintained while it continues. Should the flow still continue too free, the operation is to be repeated several days after it has ceased, and there is a certainty almost of finding some growth which was overlooked at the previous operation. After having removed the source of irritation the general health will rapidly improve, and under the occasional use of iodine within the uterine canal the uterus will gradually return to its normal size.

CHAPTER XXXI.

VESICO- AND RECTO-VAGINAL FISTULA.

History and development of the operation—Silver sutures—Button suture—Preparatory treatment—Mode of operating.

A VESICO-VAGINAL or a recto-vaginal fistula may be defined to be an abnormal opening, the result of an accident, between the bladder and vagina, or between the rectum and vagina, through which the contents of either may escape.

It would scarcely be in keeping with the practical character of this work to give the history of the early efforts made to close these openings. Although over two hundred years ago, in Holland, a vesico-vaginal fistula was brought into view by means of a speculum, and sutures were applied to it, little progress was made in any method of cure. In France, even up to the close of the first quarter of the present century, the problem remained unsolved, notwithstanding it had engaged the attention of the great surgical minds of the day.

To J. Marion Sims the world is indebted for suggesting and perfecting the measures by which this formerly almost intractable condition is rendered one of the most certain of relief within the field of surgery. It is true that in every particular feature of the operation, on which his success depended, Dr. Sims had been anticipated. In our own country, Dr. H. S. Levert,[1] of Mobile, Alabama, had published (American Journal of the Medical Sciences, May, 1829) his experiments in the use of silver wire. Mr. M. Gosset, in a letter to the London Lancet, Nov. 21, 1834, gave an account of his method and success in closing a vesico-vaginal fistula which had been produced by the cutting through of a stone in the bladder. He used interrupted sutures of gilded silver wire, which were twisted, and as clearly defines the advantages of the metallic sutures as if given in the words of Dr. Sims himself. The method of Metzler was published in Germany in 1846, and in the article not only is Sims's speculum essentially described, but also the use of clamp sutures, and the mode of denuding the edges of the fistula with scissors, the patient being in the knee and chest position.

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[1] On Kolpokleisis, etc., by Nathan Bozeman, M.D., Richmond and Louisville Medical Journal, October, 1867.

This illustrates what I have often maintained, that ideas and general principles may be new, but that mechanical procedures seldom are. When there is a demand for any invention or device, it seldom fails to be evolved, but it may pass out of use, and even out of memory, only, however, to be recalled, or perhaps re-originated, when renewed occasion demands it.

In this country Hayward, of Boston, had been successful, between 1836 and 1840, with the silk suture, while Dr. Mettauer, of Virginia, in 1847, had used the lead suture, and in the account of his operation expresses his conviction that every case of vesico-vaginal fistula could be cured. Yet, withal, were we assured of the fact that Dr. Sims was as familiar as we are at the present time with what had been accomplished before his day, it should not lessen the credit due him. What had been done fell on barren soil, bore no fruit, was not appreciated, and was destined to be forgotten. From Dr. Sims's hand the operation was accepted by the profession; it was immediately put into successful practice, and to the present day it has not been materially modified for the better, in either its principles or in its mode of execution.

His first article on this subject was published in the Am. Journ. of Med. Sciences, in 1852, and this, with his address before the N. Y. Academy of Medicine in 1857, on "Silver Sutures in Surgery," may be regarded as a summary of his experience, for since the latter date, he has given nothing to the profession on the subject.

Within the period between the two papers, he materially modified the mode of securing the edges of the fistula. At first he employed the clamp suture, which was but the quill suture, through which the wire passed, each end being held by a perforated shot which was compressed at the proper point for the purpose of securing it. Finally he adopted the simple interrupted metallic suture secured by twisting, as Mettauer and Gosset had done before him.

My association with Dr. Sims began at so short a period previous to his adopting the interrupted suture, that I am unable to judge from my own knowledge as to the merits of the controversy between him and Dr. Bozeman in regard to their respective claims for priority. I can only testify as to the value of the method as taught by Dr. Sims, my judgment being based on an experience now greater than his own, and probably unsurpassed by that of any other operator.

One of the most important features in Dr. Sims's practice was the careful preparation of every case previous to the operation, and this was the custom when I first became connected with the Woman's Hospital, in 1855.

It is claimed by Dr. Bozeman that this practice was original with him, and that he first pointed out its necessity. Dr. Bozeman has maintained, by various articles in the medical journals, that he devised the button suture, in May 1855, and instituted the practice of freely dividing cicatricial bands, and of dilating the vagina for the purpose of freeing the tissues before attempting to close the fistula.

In certain cases, when the cervix had been lacerated for some distance up the canal and above the fistula, Dr. Bozeman seems to have been the first to repair this injury. This was done that the fistula might be closed, so as to leave the uterus in a natural condition in the vagina, instead of turning the cervix into the bladder as is sometimes done. I have always followed the same plan when it could be employed, as the proper one, and had done so without any knowledge of Dr. Bozeman's claims of priority, which are certainly just.

Since 1855, Dr. Bozeman has continued to use what he terms the "button suture." This is a perforated disk of metal made slightly concave, and fitted accurately to the vaginal surface about the edges of the fistula. Through one of the holes in the row down the centre, the two ends of the suture are passed together, and over these a perforated shot which is then compressed at the point needed to secure the sutures. Dr. Bozeman has long since reached a degree of dexterity and skill in this operation, by which nearly every case coming under his care is cured, if the condition of the tissues will admit of this being done without sacrificing the generative function. This result I believe to be due more to his skill than to the special method of securing the edges of the fistula, for the results are equally as good with the simple interrupted suture. In fact, I believe for the general practitioner the interrupted suture is to be preferred to the button suture, for this certainly requires more practice for its successful application. When Dr. Bozeman establishes his claims to having been the first to employ the system of preparatory treatment now in general use, it will entitle him to far more credit than is to be gained from the invention of any special suture. When a case has been properly prepared for an operation, the edges of the fistula being freed from tension and well denuded, it will matter little whether metallic suture or silk be used, the interrupted suture or "the button." A piece of sticking-plaster, if it would hold, would answer every purpose, for without regard to the sutures, all methods fail, as a rule, if the first steps are not properly appreciated by the operator.

Into the merits of the controversy between the late Dr. Simon, of Heidelberg, and Dr. Bozeman I cannot enter, but certain features in the practice of Prof. Simon, as given by himself, are of too much general interest to be passed over. If the success claimed by Dr. Simon be up to the standard of what is generally considered as success in this country, our experience will amount to little, for what we have considered as most essential will be shown by his methods and results to be of no importance. He did not admit the necessity for any special preparatory treatment; he used silk instead of metallic sutures; he allowed his patients to get up and walk about; and discarded the use of the catheter, allowing the patient to evacuate the bladder at will. He always operated with the patient on the back, with the legs flexed on the abdomen, while, from the number of appliances he found necessary to bring the parts into view, it is very evident that he only partially appreciated the efficacy and simplicity of Sims's speculum. One of two alternatives impresses me as the explanation of these peculiar features. Either the destruction of tissue is not so great in Germany as it is in a large proportion of the cases received in the Woman's Hospital, or Prof. Simon did not succeed as a rule in closing the edges of the fistula. I make this assertion because I have demonstrated to my entire satisfaction that his plan of treatment cannot be successfully employed, except in those cases in which the fistula is very small, and in which there is a redundancy of surrounding tissue. Nor is it possible, under the most favorable circumstances, to cure so large a proportion of cases as he claims by a single operation. The explanation, in all probability, rests in the assertion made by Dr. Bozeman, in the paper previously referred to, that in a large proportion of Prof. Simon's cases the fistula was not closed, but that retention of urine was secured by the operation of kolpokleisis, as it is termed. This operation consists in shutting up the vagina in part or entirely, and is a practice which is not indicative of advance in this branch of surgery if commonly employed, nor is it one which is likely to be of permanent benefit to the patient. But this subject will be again referred to when considering the different forms of fistula and the methods for closing them.

Treatment Preparatory to the Operation for Vesico-vaginal Fistula.—Unless the greatest care be given to cleanliness, a woman will become a great sufferer and a most loathsome object in a few weeks after receiving this injury. The external organs of generation become excoriated and œdematous from the irritation of the urine, and the same condition extends over the buttocks and down the thighs. The labia are frequently the seat of deep ulcerations and occasionally of abscesses. The mucous membrane of the vagina is in part lost, and the abraded surface speedily becomes covered at every point with a sabulous and offensive phosphatic deposit. If the loss of tissue has been extensive, the inverted posterior wall of the bladder protrudes in a semi-strangulated condition, and is more or less incrusted with the same deposit and bleeds readily. This deposit frequently accumulates to such an extent in the vagina that the woman is unable to walk or even to stand upright without suffering great agony.

The first indication is to remove this deposit carefully, as far as possible, by means of a soft sponge, and then to brush the raw surface over with a weak solution of nitrate of silver. If at any point the deposit cannot be removed at first without causing too much bleeding, the deposit itself must be touched with the same solution or have the solid stick applied to it. Frequent warm sitz-baths will add greatly to the comfort of the sufferer. The vagina must be washed out several times a day with large quantities of warm water. This portion of the treatment is beyond question the most important means at our command for restoring the parts to a healthy condition. The difficulty in keeping open an artificial fistula made for the relief of cystitis, is due to the cleansing measures employed, and should teach us a lesson in reference to the treatment of accidental fistulæ. In artificial fistulæ the raw edges are kept in a healthy condition by the frequent use of the injections, and free from the irritation always exerted by a deposit from the urine. Whenever this is done, the largest sized artificial opening will often rapidly close of itself. Very few cases have been admitted to the Woman's Hospital with vesico-vaginal fistula until several months had already elapsed after receiving the injury. I can only recall two instances where women were sent to the hospital with this lesion immediately after delivery. In both of these cases the fistula into the bladder closed within a month, having had no treatment but the warm-water injections, and were discharged cured without an operation. It is true that no great loss of tissue had taken place in either case, yet the openings were large enough for me to introduce my index finger through them into the bladder. One of these cases was delivered, I believe, by Dr. Emily Blackwell, in consultation, after a tedious labor due to a contracted pelvis. The records of the other case have been lost, and cannot be found in the hospital books. Case XXV., in the "Abstract of Cases," is one of these, and is, I believe, the one delivered by Dr. Blackwell. This woman was five days in labor, and finally delivered by forceps, an opening into the bladder as well as a rectal fistula resulting. The opening into the bladder closed in three weeks, and the retentive power was actually gained before the likelihood of such an occurrence was ever suspected. She was afterwards admitted for the cure of the rectal fistula, which required several operations, and which, from its position, had not been so much benefited by the injections.

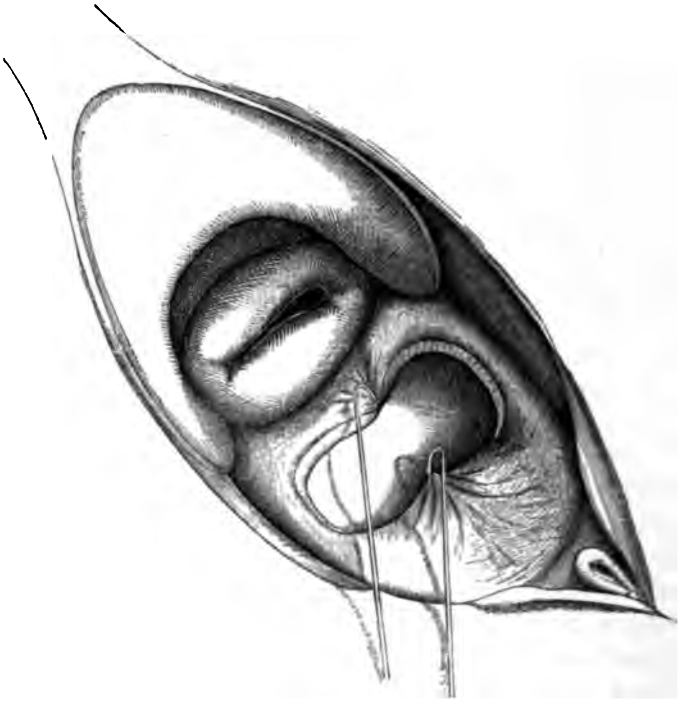
These cases certainly teach an important lesson, and my experience in the use of hot-water injections leads me to believe that if they be properly employed, many of these openings would close spontaneously, and in every instance the sloughing process would be arrested. This remark is applicable to all other injuries dependent on childbirth, and particularly so for laceration of the cervix, a large proportion of which would be healed by the judicious use of hot water. After the sitz-baths or the injections, the parts must be thoroughly dried, and the patient be protected from the effects of the urine by freely anointing the outlet of the vagina and neighboring surfaces with some simple ointment of a proper consistency. The napkins particularly must be well washed when saturated with urine, and not simply dried before being used again. Time and increased comfort to the patient will be gained by proper attention to such details.

The urine is almost always phosphatic, and must be kept in an acid condition or there will be no local improvement. The following agents I have generally used for this purpose: two drachms of benzoic acid, and three drachms of borax to twelve ounces of water, of which a tablespoonful, further diluted, should be given three or four times a day. After the urine has become acid, the dose must be reduced to the smallest quantity by which the acidity can be maintained, so as to avoid deranging the digestion. At the same time diluents must be freely employed so as to render the urine less irritating.

About every fifth day, the excoriated surfaces yet unhealed should be protected by an application of the solution of nitrate of silver. It is often necessary to pursue the same general course for many weeks before the parts can be brought into a healthy condition. This state is not reached until not only the vaginal wall but also the hypertrophied and indurated edges of the fistula have attained a natural color and density. This is the secret of success, but it is one which is rarely appreciated, and yet without it, the most skilfully performed operation will almost certainly fail.

When the proper condition has been brought about, the surgeon may then be able to decide upon some definite plan of procedure for closing the fistula. After placing the patient on the side and introducing the speculum, the edges of the opening should be seized at opposite points with a tenaculum held in each hand, and the degree of tension judged of by approximating the edges in different directions. If at any point they do not come readily together, the finger can detect the seat of resistance while the parts are kept on the stretch by a tenaculum. When the bands are comparatively slight and superficial, or are brought well up by traction, it is generally sufficient to divide them with scissors at the time of the operation for closure. But, on the contrary, when the tension is due to extensive sloughing, or when the posterior cul-de-sac has been destroyed, the parts can

Fig. 106.



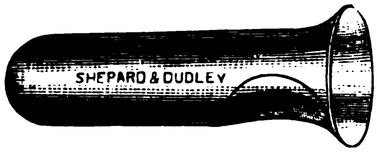
A vesico-vaginal fistula, speculum and tenacula in situ.

seldom be properly freed without more or less hemorrhage following, and it will be necessary to do one or more preparatory operations.

By placing the patient on the back, with two fingers of the left hand, as a guide, introduced into the rectum, and the thumb or index finger of the same hand into the vagina, to make counter-pressure, point after point can be snipped with a pair of blunt-pointed scissors. This can be done to any extent without using the speculum, and without fear of entering either rectum or bladder, if the position of the uterus can be recognized, but the fingers in the rectum should be used as a guide, and a sound should be held by an assistant in the bladder if necessary. When the exact position of the uterus cannot be detected, Douglas's cul-de-sac may be easily entered. This accident has happened to me several times, but without any evil consequences. When it occurs I immediately introduce the necessary number of sutures to close the wound, and then place the woman in bed to be treated as if a fistula had been closed.

After opening up the vagina, as freely as may be deemed prudent at the time, one of Sims's glass vaginal plugs (Fig. 107) should be introduced and secured in place by means of a T bandage. It should be only just long enough to put the canal well on the stretch, but not sufficient to produce sloughing or pelvic inflammation. The bleeding is sometimes excessive, but is generally controlled by the plug, and as the instrument is hollow and transparent, it possesses the advantage of a speculum in exposing the parts to view. If the blood, however, should begin to escape, it can be controlled by introducing, with a pair of dressing forceps, portions of damp cotton along the slight depression in the plug made for the urethra; then the instrument can be rotated until the outlet of the vagina has been by this means encircled by a tampon. It is remarkable how much absorption of the cicatricial tissue takes place in a few weeks, when judicious pressure has been maintained by this instrument. Scissors are much to be preferred to the knife in dividing these bands. Cicatricial tissue can be lacerated or divided by scissors with far less risk of inflammation, and with

Fig. 107.



Sims's vaginal glass plug.

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free to be seated, and it is very rare that I find any other one is called for. If the patient be covered by a sheet, drawers, and undershirt, her night-gown may be slipped up around the waist, so as to prevent it from becoming soiled, and this should be arranged beforehand by a nurse or female attendant.

The proper position for the patient has been fully described elsewhere.

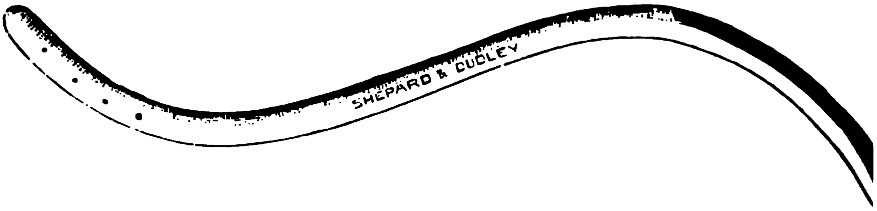
Having decided on the direction for closing the fistula, and having thoroughly freed the flaps, its edges are then to be freshened or denuded. At the most depending point the edge is to be caught up with a tenaculum, and cut away along the inner border in a continuous strip. It will require but little practice to remove this in a single strip entirely around the opening. If the denuded surface is then not of sufficient width, another strip can be removed just outside of it. The freshened surface should be extended as near to the mucous membrane of the bladder as possible, without involving it.

It was Prof. Simon's practice to include the vesical mucous membrane freely. When this is done even by accident, there is always a large amount of blood lost. In my own practice this accident has occurred twice, and on both occasions, the bladder became so distended by a clot that it was necessary to remove the sutures to arrest the bleeding. Dr. Peaslee, a short time before his death, lost a patient in the Woman's Hospital from hemorrhage after this accident. The surface retracted from the edge, and he found it impossible to detect the point of bleeding, or to arrest it by injection. I did not see this case, which was evidently an unusual one. I have been able in some cases to exert pressure by pushing a portion of a thin handkerchief through the fistula; then, as the ends were held, a sufficient quantity of cotton was packed into the bag thus formed. This made a mass in shape like a door-knob, which would press against the bleeding surface when traction was made on the portion of the handkerchief outside of the fistula. Under ordinary circumstances the bleeding can be arrested by means of a suture passed from the vagina, through the septum into the bladder, then across to some distance on the other side, and then out into the vagina again. In this way, the bleeding vessel, which comes from the neck of the uterus, or from the neck of the bladder, is ligated, as it were, and the bleeding is arrested. One precaution, however, must be taken, to avoid including the ureters, and this can be done by passing the suture at a less distance than half an inch on either side from the median line. It is almost of as great importance to obtain a broad surface for union, as to free the parts from traction.

As the edges are generally too thin after the tissues have been destroyed by sloughing, it will be necessary to extend the denuded surface on to the vaginal wall, or to split the edges to a certain depth. The former plan is the one usually adopted. To bring these surfaces up in a fold together renders it all the more necessary that the parts should have been freed from tension. When this plan is followed it has been asserted that the edges are rolled into the bladder, but this is not true, since the sutures are always introduced at the edge of the mucous membrane of the bladder, so that surface must be brought into apposition, and no tissue can be turned in. The operation, however, is never more than partially successful, unless the precaution be taken to extend the freshened surface some distance beyond each angle of the fistula, until the folds which are formed become lost on the vaginal level. Let the reader pinch up two small folds of a napkin together, when it will be easily seen that these have to be extended to some distance before they can be smoothed down to the common surface. When the necessity for extending these folds has not been appreciated, the operation is always exceedingly liable to fail, on account of a small opening being left at each angle.

I have already described the manner of introducing the needles, each armed with a silk loop, into which the wire is to be hooked. Also the mode of twisting these sutures is given, and of bringing the parts together. These rules are all applicable to the general use of silver sutures, but, in connection with the present subject, it would be advisable for the reader again to refer to the chapter descriptive of their use.

Fig. 108.



Sims's self-retaining, or sigmoid, catheter.

After completing the operation, the patient is to be turned gently on the back, and a catheter introduced. If the urine be discolored, a quantity of tepid water must be injected into the bladder for the purpose of washing out any blood which may have accumulated there.

To Sims's sigmoid, or self-retaining, catheter I am satisfied that we are greatly indebted for success in this operation, as well as for much comfort which it affords the patient. It should be made of block tin, that the curve may be altered to suit each individual case. It should not touch the fundus of the bladder, yet it ought to be of sufficient length to properly balance in the urethra, and to lie close up behind the pubes. When the fundus of the bladder rests on the point of the catheter, as it often does when the instrument is not properly balanced, it must be withdrawn, and the necessary change made in its shape. A want of attention to this point will lead to much irritation of the bladder, and will cause a failure of the operation. Perforation of the bladder and death may result from neglect of this, as I have known to happen in one instance.

The catheter is generally made five inches long before being bent to the proper curve; a greater length, however, is necessary if the patient is unusually fat. As a receptacle for the urine, a large-sized oval cup may be used, such as are found in bird cages, or one of any other convenient shape. The catheter must be removed several times a day for the purpose of cleaning it; this is done by forcing a stream of water through it from a large syringe. The patient should be instructed to notice carefully that the urine escapes freely at all times. It is well to have two catheters, so that one may be introduced immediately on the removal of the other.

The patient must lie on the back for the greater part of the time, and, if possible, preserve this position until the sutures shall have been removed. It will add greatly to her comfort to have a double inclined plane, well padded, to support the lower limbs when drawn up, and this can be removed from time to time, so that the legs may be stretched at full length for change of position. The support should be open at the ends, and a portion of the side be removed, so as not to interfere with the catheter.

A sufficient quantity of opium should be administered daily to keep the bowels constipated until the sutures are removed, and the diet may be a generous one, but should be regulated with the view to cause no disturbance of the bowels.

The sutures are generally removed on the eighth or tenth day, and in the manner already described. Twelve hours afterwards a dose of castor oil should be given. The catheter must be continued in use for a few days longer, according to circumstances, and after the fourteenth or the twentieth day the patient may sit up.

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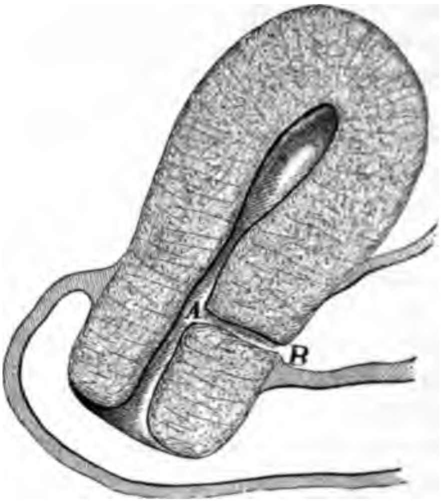
the vagina and not across the passage, since this would have the effect of drawing down the uterus more or less. This might result in a form of retroversion very difficult to correct. Under other circumstances, where great loss of tissue has occurred, it becomes necessary to draw down the uterus, and it remains permanently retroverted, but no special difficulty results from this, since the uterus will occupy the position of the tissue lost. The treatment of these simple cases requires no further direction, since it has been already fully detailed in the general description.

2. *Injury of the cervix uteri and posterior cul-de-sac, the fistula being, as a rule, in the upper portion of the vagina, although sometimes the whole base of the bladder is also involved.* Such an injury results from laceration and from sloughing caused by the presenting portion of the child while it is yet above the superior strait. Anterior lacerations of the cervix directly in the median and extending into the bladder are the varieties most frequently found. Sometimes a lateral laceration of the cervix on one side, extending into the bladder, seems to have been formed. But I am inclined to regard these lacerations as first occurring in the median line, and from inflammation or sloughing about the cul-de-sac being displaced to one side. This complication, involving the cervix, is of more frequent occurrence among those who have borne a number of children and have the abdominal parietes much relaxed, than it is among primipara. The cause may be suspected, therefore, to be due somewhat to rigidity of the os and an anterior obliquity of the uterus.

In these cases there is almost always some effort of nature to repair the injury. The laceration through the base of the bladder is generally found to have been partially closed by granulation, and that of the cervix uteri entirely so. Occasionally, the whole line will be found bridged over, leaving only a fistulous tract at the bottom of the original fissure, opening into the cervical canal a little above the line of junction with the vagina, as shown in Fig. 109, from *A* to *B*. Sometimes the laceration extends not only into the base of the bladder from the anterior lip, but backward through the posterior one. In these cases the opening into the bladder may close, leaving only a small fistula against the uterine wall, while the tear through the cervix remains ununited. Occasionally the tear both in the cervix and the vesico-vaginal septum will close from each end, thus leaving a small opening in front of the cervix, as shown in Fig. 110.

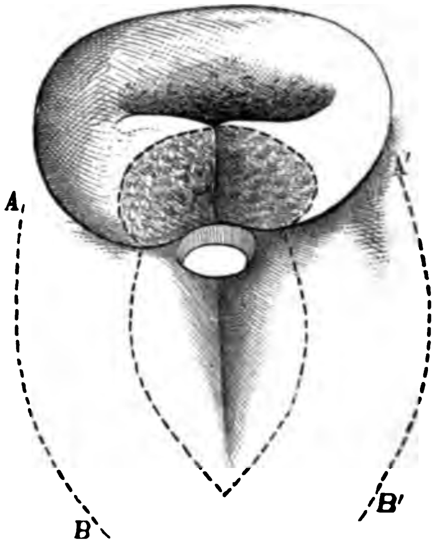
The passage by which the urine escapes from the bladder into the uterine canal, as shown in Fig. 109, can be remedied only by reproducing the original condition of the injury. This necessity has been long recognized, but no one, so far as my knowledge extends, ever realized the true cause of the lesion until I described it as a result of a laceration of the cervix which had healed over from above, leaving

Fig. 109.



Fistulous tract after healing of a laceration.

Fig. 110.



Small fistula in front of the cervix.

the sinus below. It was thought that a slough took place, but this is impossible, since, under all circumstances, the wall of the bladder is subjected to the same degree of pressure, and would be equally injured. The bladder becomes necessarily interposed between the presenting portion of the child and the bony walls of the pelvis, so that the uterine tissues could not be injured without the coats of the bladder being damaged, even to a greater extent.

I have occasionally met with cases in which a probe could be passed from the bladder along the sinus *A B*, Fig. 109, until brought into contact with a sound in the uterine canal; but these are exceptional. The proper mode of operating is to divide the cervix in the median line with a pair of scissors, through to the vaginal junction; then, by means of a blunt hook, the mouth of the sinus at *A*, Fig. 109, must be found, after which the completion of the operation becomes simple. The whole tract of the sinus must be laid open, and its walls must be removed in a single strip, from *A* to *B*, which may be done with a pair of scissors or with a small scalpel, first catching up one end of the sinus with a tenaculum. A long, straight needle is used to carry the suture, and the flaps are held widely separated, so as to straighten out the course of the sinus, which greatly facilitates the passage of the needle. But it is by no means an easy matter to accomplish this, since, without great care, the needle will be broken off, leaving a portion buried in the uterine tissues. The point at which the needle is to be introduced must be caught up with a strong tenaculum, in order to steady the parts, and the needle, as it is gradually forced through, must be seized and urged on, close up to its point of entrance with the tissues. When the tissues are more than usually dense, it is often necessary to employ a lance-pointed needle or one having a cutting edge. A straight needle, or one nearly so, is the only one which can be directed with any certainty. Each suture must pass beneath the course of the sinus, or the urine will again find its way into the uterine canal. The operation and after-treatment are in every respect the same as for laceration of the cervix.

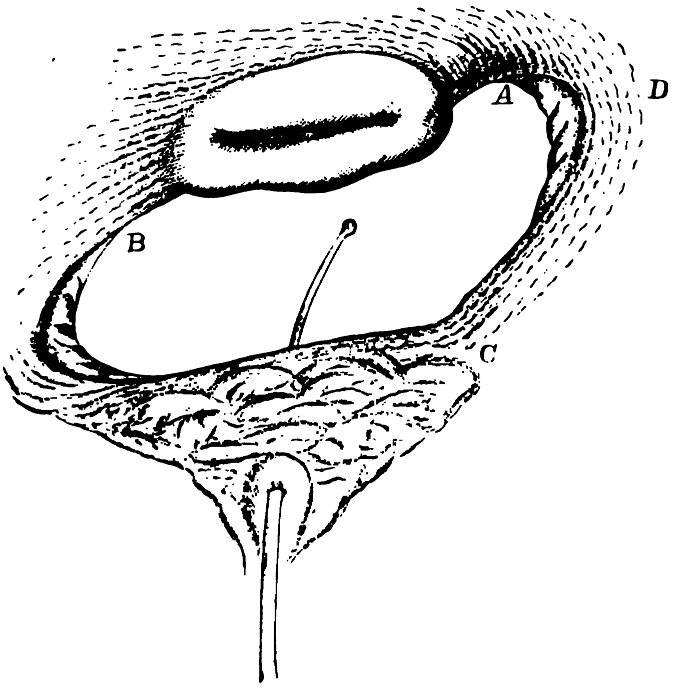
Usually it will be difficult to bring the edges of the fistula together without removing a portion of the cervix, and it may be necessary to take out a V shaped portion without going through to the canal, and then to freshen the edges of the fistula and the vaginal surface over a space equal to that represented within the dotted lines, Fig. 110. The necessity for extending the freshened surface to such a distance from the angle of the fistula, has already been explained, and it is particularly necessary in this location on account of the great liability

becomes movable. The fistula is then closed by drawing down the neck of the uterus and uniting it to the neck of the bladder. The result is that the vagina becomes very much shortened, and the uterus retroverted, but the latter condition, in consequence of the great loss of tissue, causes little or no disturbance.

Cicatricial tissue can sometimes be utilized as in the following case.

Case XLV.—Mrs. W., was sent to the Woman's Hospital Oct. 1864, by Dr. Frank H. Hamilton. The previous history of the case will be found in the "Abstract of Cases" (No. 34). The entire base of the neck of the bladder had been lost, and a portion of the anterior lip of the uterus, as shown in Fig. 111. The posterior wall and fundus of the bladder protruded through the fistulous opening into the vagina. The cervix was surrounded by cicatricial tissue, and its posterior lip was blended with a mass of the same character filling up the cul-de-sac. The bands were more dense to the right side, and,

Fig. 111.



Fistula, involving the whole base of the bladder.

spreading over the lateral wall of the vagina, extended forward along the sulcus, so as to involve a portion of the anterior lip of the fistula. By the tension thus exerted the fistula was drawn obliquely across the axis of the vagina, carrying the angle on the right side into the cul-de-sac, somewhat posterior to the cervix uteri. When the patient was placed on the knees and elbows, the fistula presented the appearance indicated in Fig. 111, being more than three inches in length, and over an inch in breadth in its widest diameter between the cervix uteri and the neck of the bladder. At each extremity of the fistula the edges were shelving, so as to narrow somewhat the opening on the bladder surface. The mouth of the ureter on each side could be seen in the edge of the fistula at *A* and *B*. The uterus was almost immovable, while the anterior lips of the fistula, in the neighborhood of the neck of the bladder was quite free. The urethra was uninjured.

At the operation the cervix was freed of its adhesions behind, so that it could be readily drawn down to the neck of the bladder. The division was extended well towards *A*, and, in the direction *B*, nearly to the angle of the fistula on that side. It was, however, purposely not carried entirely across the vagina, in order that the remaining portion of the band running from the cul-de-sac along the anterior lip, *D C*, might, by its traction, keep the edges of the fistula together, free from strain, after the sutures were twisted. But before this force could be brought into action it was necessary to separate the attachment of this band freely in the direction *C D*, from the neighboring cicatricial tissue on the lateral wall of the vagina. As soon as this was done, that side of the fistula was drawn nearly over to the neck of the uterus, and the opposite edges could be brought together, free from tension at any point. As the bladder protruded through the fistula, so as to obscure it entirely when the patient was placed on the left side, it was necessary to perform every step of the operation on the knees and elbows, and nearly two hours were required. With the exception of the shelving portion at each angle of the fistula, no other part of its edge was included in the line of freshening. It was extended a little outside on the vaginal surface, and across the cervix uteri in front of the os. A more uniform or regular line was thus obtained, and the cicatricial edges of the fistula were avoided. The cervix uteri was attached a little to the right of the neck of the bladder, and when the operation was completed, owing to the traction exerted by the undivided portion of the band extending from the cul-de-sac in the direction beyond the point *D*, the line of union was somewhat oblique, but at the same time nearly in the axis of the vagina.

Ten days afterwards, on examination, every portion of the line was found perfectly united; but, in consequence of its great length, it was deemed advisable to leave the sutures in a few days longer. During the night the woman became intoxicated through the kind offices of some outside friends, and was on her feet for several hours. In the morning, the urine was found escaping freely from an opening formed by the tearing out of the last suture in the angle on the right side, and was large enough to admit readily the point of a sound.

She was discharged for disorderly conduct, but was subsequently re-admitted and cured.

This case beautifully illustrates a mode of procedure of which I always avail myself when possible. It aims to utilize the line of tension exerted by the cicatricial tissue, so that it will contribute directly towards approximating the edges of the wound, and thus aid in relieving a strain which might otherwise be too great for the sutures to bear. I am satisfied that this case could not have been cured by any other method. Another point of interest is that the edges, requiring eighteen sutures, presented the longest continuous line I have ever seen brought together in the vagina, with a single exception. This was a case in the hospital, in which the child's head had passed into the rectum, lacerating the whole recto-vaginal septum from the cul-de-sac through the sphincter ani and perineum. The rent was closed by twenty-three sutures in the vagina, and five through the perineum, with the result that it united throughout. But in this case there had been no sloughing, and the edges within the vagina lay almost in contact.

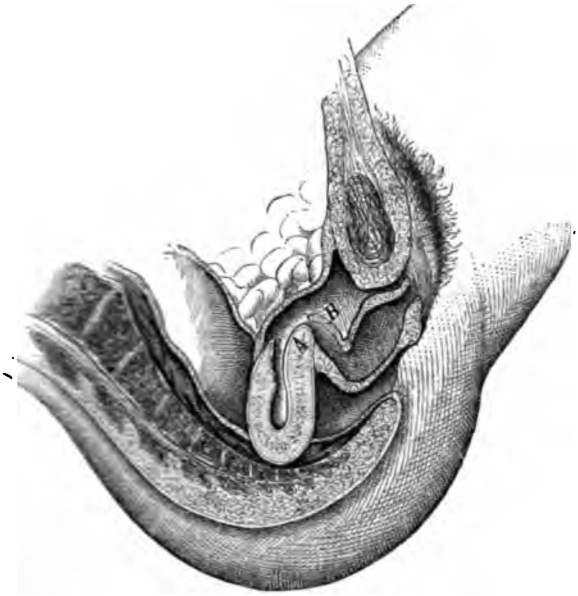
I have in two instances closed the os when a condition existed like that represented in Fig. 109, page 628, and the menstrual blood was thus turned into the sinus *A B*, and escaped by the bladder.

In one case the opening was so high up in the uterine canal, that I deemed it unsafe to attempt an operation for reaching the sinus. To prevent pregnancy, the os was closed in one of the women, as I found the pelvis much contracted, and learned that a delivery had already been so difficult as to greatly endanger her life.

Fig. 112 represents a condition in which the uterus is retroverted and bound down by adhesions. The anterior lip has sloughed away, and from the inflammation extending to the vesico-vaginal septum a fistula has been formed in front of the cervix.

In the case which this represents extensive cellulitis also occurred, followed by sloughing in the cul-de-sac, and on the lateral walls of the vagina. As a consequence, the vagina became shortened, and the vesico-vaginal septum doubled on itself. As the patient lay on the back the finger could be passed into the bladder, with more or less difficulty. But the parts had become so immovable, from the inflammation and contraction, that it was impossible to bring the fistula into view except by means of a hand-glass or a frontal mirror, and a small laryngeal mirror. Although the fistula could be thus seen by placing the small mirror at *A*, it was impossible to make use of the reflected light for either denuding the edges, or for introducing the sutures. The fold [illegible] of *B* was immovable, but I attempted to overcome the difficulty [illegible] cutting through at the neck of the bladder, and with a pair [illegible] scissors I divided the septum backward in the median line to the [illegible]. But, in consequence of hemorrhage and of the prolapse of

Fig. 112.



Vesico-vaginal fistula, with loss of anterior lip of cervix (uterus retroverted).

the fundus of the bladder through the opening, and of the falling of the sides together, I failed in every position and with every instrument to obtain a satisfactory view.

In two cases in which I cut through the base of the bladder, after the incision had healed, I closed up the vaginal canal at its upper [illegible]. To accomplish this I freshened as much of the canal as could be brought into view by placing the patient on the knees and [illegible], and the sutures were introduced so as to unite the sides of the [illegible] A B. This left the uterine canal in direct communication with the bladder, a procedure from which no harm will result if the [illegible] properly closed; that is, in such a manner that there shall [illegible] receptacle, or a pouch, for the collection of stale urine, or [illegible] a stone could form. It is doubtless an acknowledgment of a limit to our resources, when such a procedure [illegible] yet, sometimes we have no other alternative. We [illegible] accept as a principle the necessity for obliterating, as far as possible, any cavity in which the urine can remain and become alkaline, and hence phosphatic. Whenever a pouch has to be left, the outlet must be large, and so formed that it will be emptied thoroughly whenever the bladder is evacuated. Unless this is carefully observed no permanent benefit will result to the patient, but, on the contrary, the misjudgment of the surgeon will lead to serious consequences. Sometimes the bad effects may be delayed if the patient can be made to realize the necessity for frequently washing out the bladder through a double canula, but, even with this care, permanent exemption from trouble is not to be expected.

Whenever urine is allowed to remain a long time in the bladder it decomposes and becomes phosphatic, and cystitis invariably results, leading to œdema of the submucous tissues and obstruction to the mouths of the ureters. When once this condition becomes established the ureters gradually dilate, and it then remains but a question of time before disease of the kidneys develops, with death, from uræmia, as the consequence. It often proves a fortunate occurrence for the patient when an encysted stone is found. This either cuts through into the vagina by an ulcerative process, thus affording the needed relief, or so much irritation ensues, at a comparatively early stage, that the surgeon is compelled to interfere.

There exists no greater malpractice in surgery than the procedure which, we are told, was practised by that great master, the late Prof. Simon, of Heidelberg. He never seemed to appreciate the importance of the principle which I am now endeavoring to impress upon the reader. Without hesitation he would shut up the vagina when difficulties presented themselves in bringing together the edges of a fistula, as if the sole object was to give a retentive power regardless of the consequences. From my own observation I have learned that it is but a question of a few months, a year, or possibly two, before serious consequences must arise after leaving a receptacle, like a portion of the vagina, in which the urine may stagnate. To give a retentive power for so short a time is not a sufficient compensation for the suffering and consequences which supervene. As the result of my experience, I would urge that the operation should never be resorted to under any circumstances. The maximum has now been reduced to two or three per cent. of cases where the resources of the surgeon cannot overcome all the difficulties which may be presented in closing a vesico-vaginal fistula. Something more may be accomplished in the future; but, at present, these incurable cases are better without the retentive power when gained by

Simon's method. The surgeon endeavors to cause the parts to heal thoroughly, and educate the patient in the art of taking care of herself, and in this way much can be done to render her condition a comfortable one.

Whenever the destruction of tissues has been so extensive as to permit the inverted bladder, filled with intestines, to protrude from the labia in an almost strangulated condition, some surgical relief is imperative. In such cases I do not hesitate, with the consent of the husband, to unite the sides of the vagina at any point within the canal at which I can gain the needed support for the bladder. This is done to relieve the suffering attendant upon the prolapsed bladder, and it is very effectual. But I always leave an opening at the most dependent portion, and one above, so that the urine cannot accumulate, and the parts may at any time be washed out if necessary. After the surfaces have all healed, and the woman has learned to keep herself free from excoriations, her health will remain good, and the escape of urine will be comparatively but a slight inconvenience. Certainly no comparison can be drawn between the comfort of one with retentive power at the cost of cystitis and its consequences, and the other in a healthy condition, with the urine escaping into a cloth or some other suitable receptacle.

3. *Loss of tissue at the lower portion of the vagina, extending to one ramus or to both.* It is an exception to the rule to find a small fistula in close contact with the bone. This usually happens in connection with the loss of a large portion of the base of the bladder, by which the inner face of one or both rami becomes denuded, so that the surface of the bone, covered with its periosteum only, forms a portion of the fistulous edge. It may prove an easy matter to free the edges of a large fistula so that they can be brought in contact from any direction, but the line of union must terminate in a triangular opening, the base of which will be formed by the ramus. It then becomes impossible to close such an opening in the same line, beyond a certain point, even with a superabundance of tissue. The usual plan is to unite the edges of the fistula, by one operation, up to the ramus as close as can be done, leaving the triangular space for a subsequent operation. To close such an opening against the inner face of the ramus, in even a thin subject, where it can only be brought in view with difficulty, is one of the severest tests of the surgeon's skill in manipulation. But from the fact that the line of the ramus separates and diverges from the edge of the fistula, such a condition must be incurable.

One of two plans may be followed for closing an opening in this situation. A flap may be dissected off from the vagina above and brought down over the opening, the mucous surface of the flap being turned in towards the bladder. Or the tissues may be dissected from the base, and as they recede the edges of the fistula will become free, and a sufficient distance be gained between the fistula and the ramus to allow of the passage of sutures. This plan is the one best for the general operator, and is most suitable for the greater number of cases. But the chief danger is from hemorrhage, which may be severe if a large branch of the subpubic artery, which runs along the inner edge of the ramus, be wounded. This accident can be avoided by using a pair of scissors to free the tissues from their close union with the bone, the parts at the same time being kept on the stretch by the traction of a tenaculum. When it is necessary to make an extensive dissection the tissues must be freed with the handle of a scalpel, as the inner edge of the ramus is approached. The line of incision ought generally to be greater in length than in depth, since, after the mucous membrane has been once freely divided, the elasticity of the subjacent cellular tissue admits of great mobility. The operation can seldom be performed in any other position than on the knees and chest. But, under all circumstances, it is exceedingly difficult to introduce the sutures. From the close proximity of the bone, but little space is left to turn the needle, and a number are generally broken before the completion of the operation. By introducing two silk loops, from within outwards, through the edges of the fistula, at opposite points, one loop can be passed into the other and drawn through, so that it becomes continuous, as if only a single one had been passed, and it will then be a simple matter to attach the wire and draw it through in the usual manner.

4. *Sloughing or laceration at the neck of the bladder.* The most frequent injury to the neck of the bladder is a laceration, the consequence, in all probability, of traction exerted while the bladder is over-distended by urine. The urethra is not only torn, but also the neighboring soft parts, so that a rent generally extends from one ramus to the other. The portion of the urethra close up to the neck of the bladder soon becomes so dilated that the finger may be introduced through it for some distance within the canal. The mucous membrane anterior to the neck of the bladder protrudes in a hypertrophied mass resembling a prolapsed anus. In the centre of the prolapse the vesical orifice of the urethra will be seen undilated, and to correspond in diameter to the portion of the urethral canal in the anterior flap.

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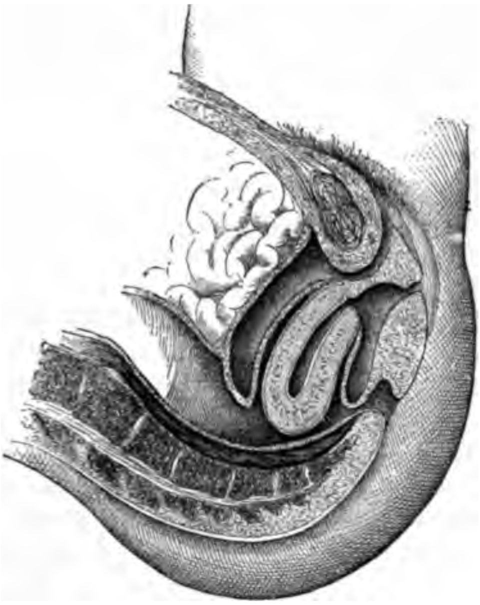
anterior lip against the pubes just in proportion as the uterus is dragged upward. In many cases the desire, or appreciation of the necessity, to empty the bladder, is never regained after extensive sloughing, notwithstanding that retentive power may have been restored by art.

Fig. 113.



Cervix-uteri united to neck of bladder to secure retention.

It then becomes necessary to empty the bladder at regular intervals, and while many are able to do so by the action of the abdominal muscles, the introduction of a catheter by the woman herself is the safest plan to pursue. The position on the knees and elbows is the one which will insure the emptying of the urine from the long pouch behind the uterus, and in proportion to the difficulties of the case, the more essential will be the necessity for washing out the bladder from time to time.

5. *Injuries to the urethra and defective development.* Small openings are sometimes found in the course of the urethra, and are generally the result of lacerations. They are easily closed over a large sized catheter, and the line of union should be in the long axis of the canal, that the formation of a band across the course of the urethra may be prevented. The edges of the fistula are generally too thin to be united alone, so that it is almost always necessary to freshen

[illegible]

[illegible] The oper[illegible] of surgery, requirin[illegible] patience for its comple[illegible] an operation to be [illegible] intelligent, and both [illegible] whole urethra lost by the clumsy use of a catheter, and sometimes the same occurs from a want of proper vitality. But after years have been thus spent in opening a vagina, and in bridging over a fistula, or in forming the urethra, a more common fate is to hear that all has been lost in a few weeks, after the woman returned home cured, and all from neglect in emptying or washing out the bladder properly. Therefore as I advance in life, and come to place a lower estimate upon the amount of common sense developed in the average individual, I grow less disposed to waste my energy on the slim chances of success or permanent benefit from this procedure.

Formerly it was my impression that there could be no retentive power, when the neck of the bladder had been lost, unless the new passage was made to enter at as high a point as possible. It was thought, as I have already stated, that as the urine accumulated, the bladder must rise out of the pelvis, and in doing so, that the patulous passage is drawn tight under the arch of the pubis, thus securing a retentive power before the urine had reached the level of the opening. It was customary to make a false passage into the bladder through the sub-pubic ligament, or through the tissues behind the pubes, and when this tract had healed, the new canal, which was to serve as an urethra, was then joined to it.

The risk from retention of stale urine in the bladder, was of course fully appreciated, and that this could only be avoided when it was possible to fully impress the patient with the necessity of washing out the bladder daily. The result of my subsequent experience, however, led me to look for some other expedient to obviate the risk which trusting to the judgment of the patient involves.

On reflection, it occurred to me, that with the entrance to the bladder at the most dependent part, but with the canal extended upward in advance of the natural point of outlet, the traction of the cicatricial tissue might be so regulated as to gain a controlling power. Therefore, I made a new canal, somewhat trumpet-shaped, with the idea that if the traction proved sufficient to excite a retentive power, when the pressure of the abdominal muscles was exerted for expulsion, the first portion of urine forced into the funnel extremity, would easily open the canal. It was also thought that the stream, being once started, would be continued by the force behind, and that the retentive power which had increased with the accumulation, would lessen in proportion as the bladder emptied.

The incisions were made to diverge from without inwards, and directly downwards, instead of passing obliquely behind the flaps. For it had been noted that when the flaps were dissected up, there could be but little lateral traction exerted by the cicatricial tissue on the diameter of the canal, as it was all lost behind and under the arch of the pubis. By separating the lines of incision, the lateral force exerted was greatest towards the outlet, and sufficient in the beginning to arrest the escape of urine, unless forced open with a stream by pressure of the abdominal muscles.

With the accumulation, an increasing retentive power becomes established along the whole canal, in its axis, but which at the same time can be readily overcome at will. In other words, by obtaining the greatest amount of traction which can be exerted by the cicatricial tissue, the triangular surface, between the two incisions, is drawn tense, with the effect of flattening together the two sides of the canal beneath. Then, in addition, with the base of the triangle towards the bladder, any force exerted in that direction would be uniform along the whole length of the canal, and must increase with the traction.

The congenital defects of development are a patulous condition of the canal and a cleft urethra, resembling a harelip. The first condition, when found, is an accompaniment of the congenital absence of the uterus and vagina, and has been already referred to while treating of that subject. The cleft urethra also resembles the defect found in the anus and extending through the perineum, which, under these circumstances, is absent; this has also been treated of. I have never operated to remedy this defect in the urethra, but expect to do so at no distant day for a young woman eighteen years of age, who has never had a perfect retentive power of urine since her birth. The appearance closely resembles the condition left after the meatus has been lacerated in dilating the urethra. The operation which would be applicable is similar to the one employed for repairing a laceration, and will be treated of hereafter when describing that injury.

6. *The ureter opening into the vagina, as the result of injury, or as a congenital defect.* The ureter can scarcely communicate directly with the vagina as a result of childbirth, but when the loss of tissue has been very extensive, so as to involve the ureter in the edge of the fistula, it becomes sometimes rolled out on to the vaginal wall in the process of healing.

It is not a rare condition to find the urine escaping from the ureter into the cul-de-sac, a little posterior to the cervix, but the lesion is always, in my opinion, connected with an attack of cellulitis. In the normal condition the point of entrance for the ureters in the base of the bladder is at least an inch below the level, and about the same distance in front, of the usual opening into the vagina. In fact the ureters have no direct connection with the sides of the vagina, but only indirectly through the connective tissue of the pelvis. It seems not only necessary that a cellulitis should have previously existed, but that it should have terminated in a pelvic abscess to bring about this condition. By means of the abscess, the ureter is dragged up to the level of the vagina at this point, where it becomes attached by adhesive inflammation. As the course of the ureter must then be more or less bent at an angle, the passage of urine to the bladder becomes partially obstructed. This condition, in time, will excite inflammation, and lead to an opening in the vaginal wall through which the urine will escape from the ureter. Whenever this accident has followed childbirth, I am satisfied that the explanation offered as to its connection with cellulitis will be found correct.

Many years ago a case came under my observation where a pelvic abscess had made its way through into the cul-de-sac of the vagina, and afterward all the urine of one kidney apparently escaped by this route. I was then unable to attempt any procedure for relief, and have never known the result in the case. Since that time I have seen two instances where the ureter had been cut across in the same neighborhood by the surgeon, when attempting to evacuate into the vagina the contents of a pelvic abscess. When the abscess is between the folds of the broad ligament this point would be naturally chosen for its evacuation, on account of its dependent position, and because fluctuation would always be most marked there. This not being the natural position for the ureter, and it being difficult to determine with accuracy if it is thus abnormally located, it is scarcely possible to guard against the accident in using a bistoury. As rare as the accident must necessarily be, even this risk may be lessened somewhat by partially emptying the abscess by means of an aspirator. Afterwards a larger opening can be made, and the distension having been relieved this would allow the ureter to sink below the level of the vagina. Of course, if adhesions have formed between the ureter and the sides of the vagina, the accident cannot be guarded against.

For the relief of one of these cases I closed the opening into the vagina, hoping that the urine would then find its way into the bladder. But the operation failed, for after an hour or two the urine forced its way between the sutures. The woman died suddenly about six months afterwards, and I made a post-mortem examination. It was found that both kidneys were in an advanced stage of Bright's disease, the result of the obstruction to the ureters by an old cellulitis. The ureter, on which I had operated, was adherent to the side of the vagina, as I have described. Its passage to the bladder beyond was closed, while the canal itself was enormously dilated as far up as the kidney.

The history of the other case is as follows:—

CASE XLVI.—Mrs. B., aged 25, married at 21; sterile. As the result of a fall, had been an invalid for two years and a half previous to being admitted to the Woman's Hospital, in the service of one of my colleagues. She had had a pelvic abscess opened at home some months previous, since when there was a continuous discharge of pus, and the urine had escaped freely by the vagina. The urine, however, did not all escape by the vagina, for she was obliged at certain intervals to evacuate the bladder in the usual manner. Shortly after her admission an attempt was made to enlarge the opening between the abscess and vagina, but the hemorrhage was so great before the operation was completed, that the cavity had to be filled with "iron cotton." This was followed by a fresh attack of cellulitis and symptoms of blood-poisoning, and by some bleeding, before the cotton could be removed, or before it became loosened by suppuration. Shortly afterwards she was transferred to my service. Her condition then was one of extreme hectic, with high temperature, rapid pulse, and night sweats. At least half a pint of pus was being discharged daily from the abscess through the rectum and vagina, and the cavity of the abscess was filled with a sabulous deposit from the foul phosphatic urine. After some three weeks her condition began to improve, as the chief source of irritation from the deposit was gradually removed, and the raw surfaces healed. At first an hour or more had been devoted every day to picking off this deposit with forceps, or to injecting a stream of hot water into the cavity to wash it away.

I now advised her to return home to a milder climate, and there to expose her body, for several hours a day, to the direct action of the sun. She was advised to diminish gradually the quantity of morphine to which she had become accustomed, to take from fifteen to twenty grains of quinine a day, and, after a certain time, to begin the use of cod-liver oil. The hot-water injections were to be continued night and morning, being thrown directly into the cavity. The sea-voyage home was of benefit, and she began to improve rapidly.

A year afterwards she visited New York, her general health being entirely restored, and entered my private hospital for the purpose of having something done to control the escape of urine. There was no longer any pus passed from either the vagina or rectum, and this change had been brought about so gradually that she could not say when it had occurred.

I was not confident of success in closing the opening from the ureter into the vagina. Until the exact condition of the canal between the seat of its division and its entrance into the bladder could be ascertained, I was unwilling to undertake any operation. After a while it was found that when some indigo-water was injected into the empty bladder, the urine passed by the vagina remained clear for a certain time, but afterwards it would suddenly become colored and increased to about double the quantity. It was thus made evident that all the urine of one kidney escaped into the vagina without entering the bladder, but after a certain time the bladder would become filled to some point of overflow, by the urine from the other kidney, and discharge into the vagina through a common opening. A probe could be passed six or eight inches backward and upward along the tract of the urethra, as it was supposed, and, with some difficulty, off to the left for the distance of an inch; but to pass it into the bladder was impossible. After a number of careful examinations I ascertained the above facts, but no indication as to the actual condition in the bladder. I determined to dilate the urethra in order to examine the bladder, by the aid of a cylindrical speculum which I had constructed for the purpose. Dr. George T. Harrison and Dr. Bache Emmet assisted me in this, and ether was administered. The urethra was dilated as recommended by Simon, and with the same form of instrument used by him, and the greatest care was taken to employ no violence. The canal was opened without difficulty, but I was afterwards unable to obtain a view of the interior of the bladder or of the mouths of the ureters, as I had hoped to do. I was greatly disappointed to find that the incontinence of urine continued for more than twenty-four hours, by which time the retentive power is usually fully regained. I realized that, in spite of all my care, laceration had occurred at the neck of the bladder, so that every drop of urine escaped, and I was apprehensive that the incontinence would continue. I delayed making any further examination for nearly a month, hoping that there might be some improvement, but this did not take place, and the patient's condition was evidently beyond artificial relief. Up to this time the urethra had remained sufficiently open for me to introduce my little finger into the bladder, only a slight effort being required to pass the meatus Having seen, within a recent period, the same condition result, in several cases, from dilating the urethra, I determined to open the bladder with the view of investigating this injury, and to ascertain how far the divided ureter was pervious. This was done November 6, 1875, when I was again assisted by Drs. Harrison and Emmet. After she had been fully etherized she was placed on the left side, Sims's speculum introduced, and I entered the bladder by the method described for making an artificial fistula for the relief of cystitis. The incision was continued with a pair of scissors as close up to the uterus as was deemed safe, and then forward to the neck of the bladder, laying open the urethra in a continuous line for half of its length, without cutting entirely through at the neck of the bladder. Through this long incision a large size duck-bill speculum was passed under the arch of the pubis into the bladder. Sufficient light was obtained to illuminate every portion of the bladder except the part covered by the speculum. With a tenaculum I rolled out the flaps, one after another, on each side, and exposed the mouths of the ureters without difficulty. The probe passed along the course of the right ureter for a distance sufficient to show that it was in a normal condition. On the other side it could not be advanced to a greater distance than an inch, when a solid septum was felt between that point and the opening into the vagina. By introducing another sound in the other part of the ureter, towards the kidney, it was evident that the course of the two portions of the canal were not in the same direction. It was also shown that a sharp turn, or angle, existed between the two points, so that if an attempt was successful in forcing a passage from the bladder, either perforation would occur or the adhesions would be separated from the vagina, and the urine would escape into the peritoneal cavity.

After some difficulty I succeeded in finding the opening where the abscess had emptied into the bladder. It was situated to the left and just below the peritoneum, where this dips down between the broad ligament and side of the bladder. By inserting my finger into the bladder I was able to advance a probe from the vagina along the tract of the old abscess until it passed into the bladder through the opening I have described above. I also ascertained by this examination that the portion of the urethra entering the bladder was permanently closed, and that nothing remained of the old pelvic abscess but the tract which had been kept open by the overflow of urine from the bladder. As I passed the light silver probe from the bladder along this tract into the ureter, I could feel it by means of a sound introduced through the vaginal opening. This satisfied me fully that I could with safety close the opening into the vagina and turn the urine into the bladder from the left kidney through the tract of the old abscess.

I had opened a portion of the urethra and had partially cut through the tissues, at the entrance of the urethra into the bladder, for the purpose of being able to roll out the parts at the neck and bring the lacerated portion into view. I saw distinctly how this fissure left a crack so that the parts could not fold together properly and re-establish the retentive power. I introduced the sutures into the edges of the divided urethra from the nearest angle of the wound in the usual manner and over a large-sized block-tin catheter tube. The sides of the laceration I carefully freshened, and passed a suture so as to bring together the edges along the mucous membrane, and then to the opposite side through the little strip of tissue which had been left undivided. When this suture was twisted, it simply brought the sides of the laceration together with the divided tissues over the neck of the bladder without in any manner encroaching upon the capacity of the urethra. The remaining portion of the vesico-vaginal septum was left open for the free escape of urine, and to render the use of the catheter unnecessary until the parts just united had regained their natural condition. The operation was successful, and the sutures were removed on the eighth day

Dec. 5. (The same gentlemen assisting me.) Ether was given, and

I closed the artificial vesico-vaginal fistula and the opening from the ureter. The patient was placed in bed, and in every respect the case was treated as after the operation for fistula. At the end of six weeks she returned home perfectly well, and retaining at will every drop of urine. Several months after her return she had a fall down a flight of stairs, and wrote to me in great alarm that she was suffering from incontinence of urine as a consequence. But before she received my letter, advising her return to me, she had already regained the control, and has continued well, as I have been informed within a few months.

The result in this case is unique, and while it may be seldom that the same procedure could be adopted with safety, several important and practical lessons are to be drawn from it. There are many conditions of the bladder where it would be good practice to lay open the septum freely, as was done in this case, and by means of the two instruments form a clear diagnosis and apply the necessary treatment. No other single fact is more clearly established than that such an incision will rapidly close up, or at least to a small opening, if the edges are kept clean, and the case properly managed. Should there be no special indication for keeping the incision open, the sutures can be introduced, and the whole line readily closed immediately after making the examination. I, however, do not advocate this procedure in private practice, when it is always difficult to secure to the patient the proper after-treatment. The operation can never be a simple or promising one except under the most favorable circumstances.

Before entering the bladder, in the case I have last cited, I had determined to close the opening from the old abscess if the ureter were found pervious. In this case there was no occasion for doing so, as the canal had to be used for the passage of the urine into the bladder. But I saw that it was feasible to close such an opening within the bladder, as readily as if situated in the upper portion of the vagina. The cases are not rare where, after a pelvic abscess, feces and flatus have continued to pass into the bladder, or urine into the vagina or rectum, long after the original condition has disappeared. I am now satisfied that the bladder end of an opening in these cases can be closed within that cavity and with safety, since there must always be the remains of thickened tissue behind it to receive the suture. I am, moreover, the more confident, from my knowledge of the fact that women, in comparison with men, bear such operations well. It is a provision of nature that the female bladder is very tolerant to injury, or the dangers of parturition would be far greater. There is no comparison between the sexes as to this degree of tole-

out the flaps, one [illegible] e subjected to procedures
of the ureters w [illegible] woman.
of the right ure [illegible] the mouth of the ureters are
normal condition. [illegible] in which the opening of the
greater distance [illegible] rth. Dr. William H. Baker, of
that point and [illegible] the Woman's Hospital, has cure
sound in the [illegible] ame out near the meatus of the
dent that the [illegible] ssected up a portion of the end
same direction [illegible] r its course, near the neck of the
isted between [illegible] own into the opening, and closed the
forcing a pass [illegible] result was a success, and there is
the adhes [illegible]
would [illegible] n record.

After [illegible] ke procedure in my case for heal
abscess [illegible] As the mouth of the ureter prese
just [illegible] , I could not, of course, dissect up a
ligament [illegible] I have entered the bladder at th
bladder [illegible] re, determined to make a canal alo
of the [illegible] reached the base of the bladder, wh
I have [illegible] the two cavities in the closest relation
the [illegible] a small portion from the septum, just
close [illegible] passage terminated, and, after the sides
tract [illegible] he vaginal end with a flap dissected up an
blad [illegible] I succeeded in forming a canal, as a new
this [illegible] y turning over together the vaginal tissue
due [illegible] mouth of the ureter to the point at which
co [illegible] ladder. At this stage, during a temporary
in [illegible] aths, the patient died from an attack of pneu-
al [illegible] ed it to be pneumonia from the statement of

[illegible] *rectum from the vagina.* For all practical
[illegible] ine the consideration of this special injury to
[illegible] rth. I will, however, briefly refer to other cases
[illegible] ceration and syphilitic abscess. When cancer
[illegible] as to involve the bladder or rectum, nothing can
[illegible] the injury. There remains no course of treatment
[illegible] tion and cleanliness, and an effort to make the
[illegible] able as possible.

[illegible] cases of recto-vaginal fistula where, at first sight, it
[illegible] determine the cause. The difficulty will be all the
[illegible] the patient have had syphilis, as she would probably
[illegible] conceal the fact.

The coexistence of syphilis with the injury is a most important matter for the surgeon to determine, since no benefit can be expected from any procedure of a plastic character, about the vagina, when the parts have been destroyed by syphilitic sloughing. Generally, sloughing first takes place about the urethra or neck of the bladder, and the rectal difficulty occurs later, being produced by the discharge finding its way into the anus, where it excites inflammation which results in the formation of abscess between the rectal and vaginal walls. The abscess opens into the vagina, generally just behind the phincter ani muscle, the opening into the rectum being usually oblique and complicated by stricture, to a greater or less degree, in ront of it.

So far as my observation has extended, I may state that the resence of a stricture just within the anus is always a probable vidence, if not positive proof, that the lesion is the result of syphilis. Cancer may extend from above and produce a stricture at the same oint, but when this occurs there can be no room for doubt that the isease is cancer, and the stricture will be found to involve the whole ectum.

When a recto-vaginal fistula is situated directly against the sphincter it is always difficult to obtain good union, in consequence of constant ontractions of the muscle. In such a case it is necessary to divide he perineum and sphincter directly through to the fistula with a pair of scissors. The sides of the fistula should be freshened, and the ase treated as if a laceration through the perineum had occurred, his being the only plan by which we can be certain that the edges have been thoroughly denuded. Should the operation partially fail, a second one would be successful. But if the parts be thus divided hrough tissues which have undergone more or less syphilitic sloughng, the condition of the patient will have been rendered infinitely worse; I have never succeeded in obtaining union in the sphincter and perineum of such a case.

I would recommend a thorough course of constitutional treatment before any operation is attempted, and that the stricture be first removed before an effort is made to close the fistula by any method; otherwise, its situation will force the flatus in the direction of the fistula, if it shall have been closed, and cause it to find exit between the sutures.

To close a recto-vaginal fistula, from the vaginal side, is always more difficult than it is for one opening into the bladder. The difficulty arises from the limited means we have at command for bringing he parts into view without dragging them down.

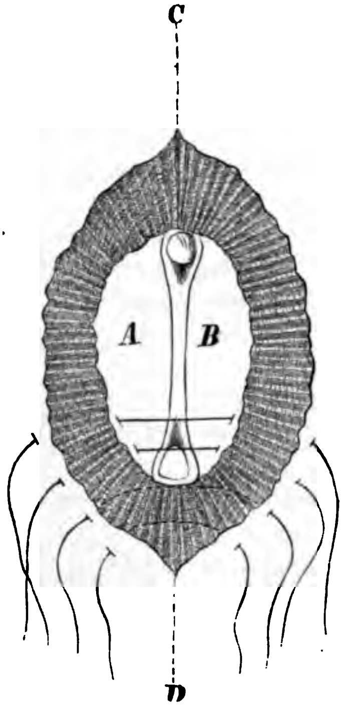
the time of his arrival in New York, and no attempt had been made to close the opening. Not only did a portion of the urine pass through the rectum, but fecal matter and gas frequently escaped with the urine through the urethra. The feces sometimes formed an annoying temporary obstruction to the passage of the urine through the penis. The bladder was irritable, requiring the urine to be passed off more frequently than natural. The rectum was also irritable, but less so than is usual in urinary fistulæ opening into it." I had no opportunity of examining the case until called upon to operate. When the parts were brought into view by placing my self-retaining speculum in the rectum, two oval openings were seen about an inch apart, one leading into the bladder and the other to the urethra.

Between these openings a narrow strip of urethral mucous membrane could be traced, which represented all that remained of the membranous portion of the urethra. The appearance was as if a section had been removed, such as would be presented by a large quill from which a segment had been removed by a sharp knife, so as to leave a small narrow portion in the centre. The facility with which I succeeded in closing this opening, by supplying the loss from rectal tissue, led me subsequently to employ the same method for closing certain cases of recto-vaginal fistula. The rectum in this neighborhood forms a double concave surface, due to its direction, its long diameter, and its cylindrical shape.

On a correct appreciation of this fact rested the success of this operation. I soon ascertained, by experimenting with a tenaculum, that if I should denude a portion of rectal surface of a uniform width, in two parallel lines, from one opening to the other, that I would not be successful in forming a urethral canal. This, doubtless, was the most obvious mode of procedure, and yet it was evident that if these freshened surfaces were turned over and brought in contact, there would result a narrowing in the centre in the shape of an hourglass contraction. In order, therefore, to reconstruct the membranous portion of the urethra in this case, it was necessary to remove the mucous membrane from the rectal surface in the form of an elliptical space, as shown in diagram Fig. 114. Four of the sutures are there represented to have been introduced for the purpose of showing that when these were tied the undenuded spaces *A B*, Fig. 114, would form a canal of uniform width, and the line of union would lie in the direction *C D* in the long axis. Now Fig. 115 is supposed to represent a recto-vaginal fistula viewed from the rectum. The mucous membrane of the rectal surface is shown to be denuded in an elliptical form, as in Fig. 114, but with the long diameter of the ellipse crosswise.

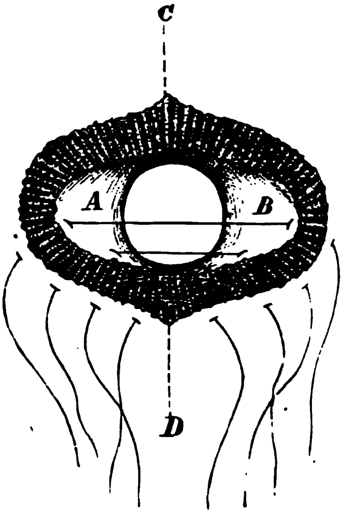
The direction of the ellipse, represented in Fig. 114, was demanded by the necessities of this special case, and is exceptional. With a circular rectal fistula the ellipse should always extend across the long diameter of the rectum, as shown in Fig. 115, in which the sutures are represented as introduced in the same manner as in the preceding figure. It is evident that in Fig. 115 the two surfaces *A B* would be turned over and become a portion of the vaginal surface when the sutures were secured in the line *C D*. Care must be exercised to bend the sutures properly, so that they shall lie flat to the rectal surface with their free end directed somewhat towards the outlet, so as to avoid catching portions of fecal matter, which would prove a source of irritation. Moreover, bending their ends in this direction enables the sponge which had been placed at the sigmoid flexure to be withdrawn without disturbing their position. The sutures should

Fig. 114.



Recto-urethral fistula in a man (urethral surface).

Fig. 115.



Recto-urethral fistula in a man (rectal surface).

remain about eight days, and no special means need be taken to constipate the bowels beyond the use of some form of concentrated food which furnishes little residual matter. If the rectum be found occupied by feces when about to remove the sutures, the mass must be carefully sponged or washed away with a jet of water from a syringe, sufficiently to bring the sutures into view. If the desire to have the bowels moved had been urgent previous to this time, a dose of medicine administered for the purpose would be safer than to distend the rectum with an enema.

This method of closing a fistula from the rectal side is only applicable to such as are of moderate size with the edges bevelled in the opposite direction, showing the destruction of tissue to have been greatest on the vaginal surface. Whenever the sides of the fistula can be brought together, the opening should always be closed from the vagina. This is the simplest of the two methods, and the one most likely to be successful, since there is more danger from hemorrhage, and the sutures are more liable to cut out from rectal than from the vaginal tissue. By making an incision on each side of the opening, parallel to the axis of the canal, the edges of a fistula may often be made to drop easily together on the vaginal surface, and without subsequent tension, even in unpromising cases.

I have seen several cases where, during parturition, the child's head had been left pressing on the perineum so long that a circular slough was thrown off, destroying the neck of the bladder, part of the urethra, and leaving a rectal fistula just behind the sphincter ani. After such extensive sloughing a cicatricial band sometimes forms around the vaginal outlet and across the remains of the urethra. In these cases, although it may be easy to bring the vesico-vaginal fistula into view and to close it, the rectal one is situated so close behind this band that unless it be divided, it is sometimes impossible to bring the opening into view. This, however, must not be cut, for the neck of the bladder is lost, and there remains only the traction from this band to furnish the retentive power, which it does by keeping the sides of the urethra in close contact. In such a case the opening must be closed from the rectum, or, if this be impossible, reliance must be placed on the sense of touch to accomplish it from the vaginal side. I was obliged in one case,[1] through fear of loss of the retentive power, to close such an opening and succeeded in freshening the edges and in securing the sutures without once seeing the fistula.

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[1] See Case No. 167 of Abstract of Cases of Fistula, in this work (Case LXVII. in my book on Vesico-Vaginal Fistula).

[illegible] N. Y., consulted me Ma
[illegible] Hammond, of her
[illegible] of incontinence of
[illegible] time previous.
[illegible] pessary, one lin
[illegible] ignorant of the
[illegible] and had not been e
[illegible] An attempt w
[illegible] but without su
[illegible] partially, and re
[illegible]

[illegible] vagina could be ea
[illegible] at the bottom of
[illegible] wall and the
[illegible] thin and tense, b
[illegible] condition the fa
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[illegible] the sutures.
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[illegible] tissue be remove
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[illegible] near the edge
[illegible] The surface, wh
[illegible] an inch and a half
[illegible] sutures were twis
[illegible] the base of th
[illegible] below, but from t
[illegible] impossible for a drop of urine
[illegible] emptied.

Miss H., aged 25, was admitted to the Woman's Hospital, from Virginia, Nov. 8, 1866, with the following history. In March, 1865, while resisting the attempt of a soldier to buckle a holster of pistols around her waist, a navy revolver fell out, and, on striking the floor, it was discharged with the muzzle upward. As a number of persons were in the room at the time, she did not inform her friends that she had been injured, and the fact was not known until she fainted from loss of blood.

On examination it was ascertained that the ball had entered the right thigh, and passing into the body, was found lodged immediately under the skin on the left side just above the crest of the ilium. She was confined to her bed for five weeks, during which time the track of the ball through the thigh healed, but with incontinence of urine remaining. Several months afterward Dr. Fisher, of Warrenton, Va., operated for the purpose of closing the vesico-vaginal fistula, but without success, in consequence of the condition of the bladder and the cicatricial edges of the opening.

I found the point of entrance into the right thigh was about five inches below Poupart's ligament, and two inches outside of the femoral artery. The ball had crossed the course of the artery and entered the pelvis and the vagina, apparently through the thyroid foramen, thence obliquely into the bladder, perforating its base in the median line, about midway between the neck and cervix uteri. After examining the bladder carefully with a sound, quite a prominent fold, or ridge, was felt on its posterior wall, stretching across the cavity just above the line of peritoneal reflection from the bladder to the uterus. It was, therefore, evident that the ball had escaped from the bladder at this point into the peritoneal cavity, and striking the uterus obliquely below the fundus had glanced off nearly at a right angle, and, passing among the intestines, lodged under the skin just below the crest of the ilium on the left side. The fistula was nearly circular, and still large enough to admit the first joint of the index finger. Its edges were tense and formed of cicatricial tissue extending to some distance from the opening.

It was evident that at the time of the accident, the bladder contained but a small quantity of urine; it was immediately emptied, and, remaining in this condition, in consequence of the opening below, no urine escaped into the abdominal cavity. The point of exit was soon closed by adhesive inflammation, while the bladder was in a collapsed state, with one portion lying doubled on another at this point, thus forming the fold felt with the sound.

The ball was easily removed, and I still have it in my possession; it was conical in shape, and weighed half an ounce.

Nov. 9. On the day after her arrival, as she was apparently in excellent condition, I operated, and was assisted by Dr. Fisher. There was no difficulty, an anæsthetic was not used, and the opening was closed by nine interrupted silver sutures. On the third day the urine became phosphatic, and it was with great difficulty that the catheter could be kept sufficiently free from mucus to allow of the

mucous membrane of the bladder; but as regards the value of this a difference of opinion exists. (When the vesical surface is included in the denudation I am quite sure that the risk of hemorrhage is increased, and the mucous membrane tends to retract from the edges of the vaginal tissue, thus rendering the effective introduction of sutures very difficult, unless they are passed within the bladder.) A nucleus is thus frequently furnished for the formation of a calculus, and often the bladder becomes so distended with a clot, as to render it necessary to remove the sutures to arrest the bleeding. I have already referred to a fatal termination in the Woman's Hospital from this cause.

To relieve all tension, the edges of the fistula on each side were put on the stretch by a tenaculum, and snipped with scissors in a parallel line along the vaginal tissue, somewhat longer than the opening, and about an half an inch from its borders. Eleven interrupted silver sutures were introduced farther back than usual from the edges, so as to include a fair portion of tissue, and the line, when secured, was about an inch and a half in length.

A smaller number of sutures were required in this operation, although the opening had been made larger. This was due to its oblong shape, which allowed its edges to close naturally together, while the former, being circular, could not have been closed without forming on the vaginal surface a puckering fold at each extremity. To obviate this condition, it was necessary to remove a portion of the vaginal tissue at some distance beyond each end, and to include the extended line in the sutures, as already explained, until the fold was smoothed down to the general line of the vagina.

The operation was finished in about three-quarters of an hour, and with but little bleeding, as the scissors had been used. After the bowels had been opened by a mild cathartic the night before, the sutures were removed on the tenth day. Two days afterwards she sat up, and returned home, cured, June 18.

CHAPTER XXXIII.

STATISTICAL HISTORY OF VESICO- AND RECTO-VAGINAL FISTULA.

I HAVE had nearly four hundred cases of vesico-vaginal fistula under my care, in public and private practice, but unfortunately the records of the greater portion of these cases are not available.

The twenty-second annual report of the Woman's Hospital contains a tabular statement, as it is supposed to be, of all the diseases which had been treated in the institution from its organization in April, 1855, to the end of the year 1875. This report was prepared by Dr. John A. Beckman, one of the pathologists of the institution, and from his notes I have been furnished with the material which will be presented on this subject.

It is stated that two hundred and eighty-nine cases of vesico- and recto-vaginal fistula, resulting from parturition, had been treated in the institution during the above given period.

This number, I am confident, contains all the cases which had been operated on by the other surgeons, who have been connected with the hospital. Dr. Sims's record I kept myself, and the histories of the cases operated on by the members of the Medical Board, since the change of organization in 1872, are intact. But the first records of a portion of the cases which were treated by me were never copied into the case book, and so were lost; and I have been able to establish the fact that the records of at least fifty-seven cases of fistula are missing, on account of the unsettled condition of affairs in the institution previous to the removal of the patients into the new building.

Dr. Beckman furnished me with outline histories of the cases on which I operated after Sept. 1, 1862, when I took charge of the institution, and as the record thus stands, I have treated nearly sixty per cent. of all the cases. But Dr. Beckman's list does not include those of which the records have been lost, nor of any case which had been admitted during the time of Dr. Sims's service, but treated by me. An important number of cases have been also excluded which had been but partially benefited, or had received but some preparatory treatment, during the above period, and yet years after they came under my care and were cured. These would not appear on the hospital books as new patients, but their records would be continued from the date of their first admission. Nor have I been credited with any case treated by me during the greater portion of the year I was in charge of the institution during Dr. Sims's absence in Europe, and previous to his departure. I believe that about eighty per cent. of all the cases which have been treated in the Woman's Hospital, previous to the making of this report, were under my charge.

To attempt the sifting of the records from the date of admission of each patient, for the purpose of separating those which had been under my care would have involved an almost impossible amount of personal labor, and was deemed unnecessary in view of the material already available, including only, as has been stated, the cases operated on by me after Sept. 1, 1862, to the date of the report. After this those still under treatment were excluded, although I believe all have been cured since that date. I shall also use any material needed which I may have already presented in my work on vesico-vaginal fistula. In private hospital I have treated a number of cases, but after they ceased to be a novelty, the record of the operation and after treatment was not kept with accuracy, unless the case possessed unusual interest.

The causes are thus given for fistulæ opening into the vagina or rectum in such cases as were admitted to the Woman's Hospital under my care.

Childbirth	171
Syphilitic sloughing into the bladder	1
Cutting of a pessary into the bladder	1
Gunshot wound between the bladder and vagina	1
Sinus of an abscess opening into the bladder and vagina	1
Breaking of a glass syringe, which cut into the bladder	1
Accidental incised wounds	3
Removal of stone	7
Relief of cystitis	16
	202

The proportion is 5.84 per cent. for recto-vaginal fistula, where the lesion has resulted from childbirth. For the present it is unnecessary to enter more into detail as to the above stated causes of fistula, unless to make some reference to those resulting from incised wounds. These cases were admitted to the hospital after they had received the accidental injury. In one, an attempt had been made to reach the uterus in a case of congenital absence of the vagina. The bladder was entered, and the case will be found detailed in the chapter on "Absence of the vagina." In the second case a portion of the recto-vaginal sep-

TABLE LIII.—*Condensed History of cases of Vesico-Vaginal Fistula resulting from Childbirth.*

Number of the labor in which injured	1	2	3	4	5	6	7	8	9	10	11	15	No record.	Average.
Number of women	35	24	11	16	7	8	4	4	1	3	3	1	4	
Proportion for each labor	49.71	14.04	6.43	9.36	4.09	4.68	2.34	2.34	.58	1.75	1.75	.58	2.34	
Average time in labor, given in hours	67.34	49.69	39.88	45.00	44.66	54.25	41.25	65.50	42.00	59.66	54.66	133.00	....	58.61
No. of children born before the injury	93	53	34	65	35	48	29	32	9	30	35	15	....	2.79
No. of children born after the injury .	8	4	....	1	....	....	1	....	....	....	2	....		
Average age at the time of marriage .	23.33	24.52	22.84	23.92	22.14	21.42	19.00	18.50	26.00	21.66	17.66	18.00	....	22.90
Average age at the time of admission	28.44	31.26	32.27	32.00	35.85	32.55	31.75	34.50	40.00	46.33	43.00	44.00	....	31.24

tum had been cut through in an operation for vaginismus. In the third instance the bladder was opened in an attempt to divide cicatricial bands which partially closed the vagina.

I shall now confine myself to a consideration of this injury as the result of childbirth.

By Table LIII. it is shown that 171 women were injured from their first to their fifteenth labor, and the percentage for each labor is also indicated. The important fact is brought out that about half of all who suffer from this lesion are injured in the first labor, and that with each succeeding labor the liability is lessened. The average duration of labor computed from rupture of the membranes as the most certain indication that labor had begun, was 58.69 hours for the total number, and for the completion of the first labor this average is greater than for any other. The average age at the time of admission was 31.34 years, which is an indication that the injury is generally sustained at a comparatively early period of life. The average age of marriage as taken on the total number is not greatly in excess of the general average on all women. But for those who were injured in the first and second labors it is sufficiently in excess to indicate that the rather late marriage of a number of women may have some relation to the accident. We may interpret these averages to indicate that the first labor, without being at so advanced an age as to have seriously jeopardized the life of the woman, was, nevertheless, with many, sufficiently late to have caused the progress to be retarded through want of elasticity in the soft parts.

Only sixteen children were borne by all these women after the reception of the injury, and there were a few miscarriages. Although the average age of these women, when the fistula was formed, was comparatively early yet they had then borne 478 children; and, although, as a rule, they were sterile afterwards, it is evident this condition was the result of the accident, since the average was already 2.79 children for each.

The number of women, mode of delivery, and average time in labor are shown in Table LIV., together with the percentage of those delivered by the different methods. About 46.19 per cent. were delivered by forceps, and their average duration of time in labor was 68.55 hours. These women were much longer in labor than those delivered by any other means, with a single exception, which is doubtless due to the comparatively small number of those terminated by traction after the head had been born and pains had ceased. Attention is particularly called to this fact, and its significance in

TABLE LIV.—*Nature of the Labor and Mode of Delivery from which Vesico-Vaginal Fistula resulted.*

No. of the labor in which injured		1.	2	3	4	5.	6.	7.	8.	9.	10	11	13	No record	Total number.	Average time in labor	Per cent
Delivered by forceps.	Number of women	41	12	6	8	3	2	1	2		1	3	....	....	79		46.19
	Average time in labor	82.41	50.08	43.00	55.37	63.00	68.50	17.00	84.00	....	60.00	61.00	....	....	......	58.55	
Ergot.	Number of women	3	....	....	1	....	....	....	....	....	2	....	....	....	6		3.51
	Average time in labor	67.00	....	....	44.00	....	....	....	....	....	59.50	....		....	......	61.00	
Ergot and forceps.	Number of women	3	1	....	1	....	....	....	1	1	....	....	....	....	7		4.09
	Average time in labor	42.00	48.00	....	....	....	....	....	60.00	48.00	....	....	....	....	....	46.00	
Craniotomy.	Number of women	9	1	....	....	....	3	1	....	....	....	....	....	....	14		8.19
	Average time in labor	48.57	40.00	....	....	....	70.00	48.00	....	....	....	....	....	....	....	53.21	
Version and craniotomy.	Number of women	....	1	....	....	1	....	....	....	....	....	....	....	....	2		1.17
	Average time in labor	....	28.00	....	....	17.00	....	....	....	....	....	....	....	....	....	22.50	
Version.	Number of women	....	....	....	1	1	1	....	....	....	....	....	....	....	3		1.75
	Average time in labor	....	....	....	1.00	5.00	18.00	....	....	....	....	....	....	....	......	8.00	
Version and forceps.	Number of women	1	....	1	....	....	....	....	....	....	....	....	....	....	2		1.17
	Average time in labor	44.00	....	48.00	....	....	....	....	....	....	....	....	....	....	......	46.00	
Embryotomy.	Number of women	2	....	....	....	....	....	....	....	....	....	....	....	....	2		1.17
	Average time in labor	23.50	....	....	....	....	....	....	....	....	....	....	....	....	....	23.50	
Traction.	Number of women	4	1	1	1	....	1	....	....	....	....	....	1	....	9		5.26
	Average time in labor	98.50	78.00	80.00	48.00	....	12.00	....	....	....	....	....	133.00	....	......	78.88	
By the unaided efforts of nature.	Number of women	17	6	2	4	1	1	2	1	....	....	....	....	....	34		19.88
	Average time in labor	45.82	48.50	31.50	34.75	56.00	48.00	50.00	31.00	....	....	....	....	....	......	44.44	
Manner of delivery not stated.	Number of women	5	2	1	....	1	....	....	....	....	....	....	....	4	13		7.60
	Average time in labor	57.31	49.00	....	....	....	....	....	....	....	....	....	....	....	......	55.00	
Total number		85	24	11	16	7	8	4	4	1	3	3	1	4	171	58.61	

reference to the popular belief that fistula is a result of instrumental delivery. It must also be noted how large a proportion of these cases were terminated by the unaided efforts of nature: and particularly that the average duration of labor was much less under this mode of delivery. Two exceptions will be noted where delivery took place in a much shorter period of time, but the number is too small to have any weight. The circumstance may be accepted as an indication that neither the occurrence nor extent of injury is due alone to the length of labor.

An explanation must be made in regard to what may seem, from a casual glance, to be an error in this table. Among the eighty-five women who received the injury in the first labor, there were three delivered by forceps and two by craniotomy, where the time in labor was not noted. The average duration of labor is taken on the real number, but the total one is given to avoid confusion.

If it were shown that medical men had been in charge of these women, the above table would indicate great neglect or ignorance. But for the credit of the profession, I am happy to state, my investigations on this point are most satisfactory. Whether the injury was sustained in Europe or in this country, but few women received medical care. The history of many shows that they were attended by irresponsible women, or had no one until at the last moment, when a regular practitioner was called in to effect the delivery. With but very few exceptions have I failed in tracing out some reasonable cause for the injury, where the case had been attended by a medical man throughout the progress of the labor. As the exceptions to the rule, however, some flagrant instances of gross neglect and of unpardonable ignorance were made evident.

Beyond question, in the majority of cases, a neglect to empty the bladder has, by retarding the progress of labor, proved an indirect cause of vesico-vaginal fistula.

Table LV. includes a certain number of cases where the bladder had been properly emptied throughout the time of labor. With others the bladder was not evacuated, and the average is given in hours for the length of time the retention existed. A few of these women were doubtful, from the fact that they suffered from puerperal fever, or were unconscious for a length of time, but the probabilities are all in favor of the supposition that retention existed. With a large number of cases no record was made on this point.

After looking over the averages, as given in Table LV., or if the time of retention be noted, one can but be astonished at the

TABLE LV.—*Vesico-Vaginal Fistula: Number of Operations required, considered in relation to the Condition of the Bladder during the Labor in which the injury happened.*

(Duration of labor in hours.)

No. of operations after injury		1.	2.	3.	4.	5.	7.	8.	10.	14.	20.	Not given.	Total number	Aver'ge time.	Per cent.
Bladder emptied regularly		13	8	3	2	2	....	....	....	....	....	....	28	....	16.37
Bladder not emptied.	No. of cases	30	10	....	1	....	....	....	....	1	1	2	45	....	26.31
	Av. duration of labor	58.90	67.80	....	26.00	....	....	....	....	24.00	34.00	23.50	....	57.24	
Doubtful.	No. of cases	3	1	....	1	....	....	....	....	....	....	....	5	....	2.92
	Av. duration of labor	109.60	48.00	....	72.00	....	....	....	....	....	....	....	....	89.40	
Not mentioned		34	20	11	2	1	1	1	1	1	....	1	93	....	54.37

TABLE LVI.—*Vesico-Vaginal Fistula: Number of Operations required, considered in relation to the Time at which Urine began to escape through the Fistula.*

(Average time after delivery in days.)

No. of operations after injury		1.	2.	3.	4.	5.	7.	8.	10.	14.	20.	Not given.	Total number	Aver'ge time.	Per cent.
No. where urine escaped from time of delivery		18	18	9	1	1	....	1	1	1	....	....	50	....	29.24
Escaped after delivery.	No. of cases	51	12	2	1	2	....	....	....	1	....	1	70	....	40.93
	Average time after	11.80	9.00	10.00	4.00	5.00	....	....	....	3.00	....	2.00	....	10.79	
No. of cases where no statement was made		31	9	3	4	....	1	....	....	....	1	2	51	....	29.82

capacity of the female bladder. The statement so often given that "the urine escaped as soon as the head was delivered by the forceps" is not necessarily an indication of harm done by the instrument, but conclusive evidence of neglect on the part of the operator to empty the bladder. While no special harm may accrue to the mother from this neglect, it is evident that the life of the child is placed more in jeopardy by the delay and increased difficulty of delivery, on account of the space occupied by an over-distended bladder. The object of Table LV. is to draw attention to the condition of this viscus. So far as stated the figures are reliable, but cannot be accepted as an indication of the frequency with which urine is allowed to accumulate. In nearly every instance, as given in the table, when any positive information was obtained I had made the record myself, and, excluding the 93 cases in which my assistants neglected to obtain information in regard to this matter, it seems probable that in at least half of the cases the bladder was not emptied during the progress of the labor. This proportion is very likely even under the average.

In Table LVI., it is shown that with a large proportion of cases, there was no loss of urine for days after delivery. It is evident, therefore, that death of the soft parts takes place, forming a slough, which requires a certain time before it can become separated from the healthy tissue. This impresses me with the belief that if the bladder were always evacuated before delivery, the loss of urine would only occur after a slough had come away, and never at the time of delivery, unless there were a laceration. It is not improbable that even the extent of sloughing might be greatly limited by measures to remove the additional source of irritation.

It is shown in Table LVI. that with 29.24 per cent. the urine escaped from the moment of delivery. With 40.93 per cent., the loss of urine did not take place for a long period after termination of the labor. While in 51 cases, or 29.82 per cent., it was neglected to make any record.

After further investigation, the proportion may vary somewhat as to the number of cases with escape of urine at birth, or after a certain time. But the average here shown in seventy cases, as to the separation of the slough after the tenth day, is likely, since from so large a number, to be a near approach to the rule.

If the testimony of these women can be relied upon, as to the frequent neglect to use the catheter before resorting to instrumental delivery, the question would naturally present itself as to cause and

[illegible] the separation of the
[illegible] with many cases, the
[illegible] in sloughing, [illegible]
[illegible] effect the delivery, while

[illegible] neglected, before attempt-
[illegible] almost incredible. But
[illegible] as in this country.
[illegible] neglected such a pre-
[illegible] if it can be ac-
[illegible] service, with no
[illegible] the single purpose of
[illegible] of time. We must
[illegible] class will mislead us
[illegible] after impaction takes
[illegible] the bladder by her
[illegible] its true condition.
[illegible] pursue and that is
[illegible] in every case.
[illegible]
[illegible] the pelvis as to
[illegible] impossibility, unless such
[illegible] lead to inflam-
[illegible] applied this difficulty
[illegible] up or turned to
[illegible] a catheter. De-
[illegible] after the bladder
[illegible] be lost and the
[illegible] possible to apply the
[illegible] must be aspirated
[illegible] male, by passing
[illegible] the bladder below
[illegible] without the slightest
[illegible] the proper course of
[illegible] was alive, and, even if crani-
[illegible] afterwards, the space thus gained, by
emptying the bladder, would [illegible] advantageous. But we have no
right to sacrifice the life of the child, even if the mother be in danger
so long as there is a possibility of saving both with little increase of
[illegible] the mother. Therefore, the bladder must be emptied first
[illegible] the next step can be decided upon. The progress of labor

is frequently retarded, and even arrested, by a distended bladder, yet delivery often takes place promptly through the efforts of nature alone after the accumulation has been removed.

In Table LVI. the condition of the bladder, in regard to the retention of urine and the time of the separation of the slough, is shown in connection with the number of operations required afterwards to remedy the injury. It would be a difficult point to establish that the number of operations bears any relation to the duration of the retention, since so large a proportion of cases, it will be seen, are thus cured by one operation, without any regard to the actual loss of tissue. The retention of urine, as has been suggested, might, at the time of delivery, necessitate a resort to great force, liable to be followed by bad consequences. But, in all probability, the mere retention itself would not lead to extensive injury. The force would be directed chiefly against the neck of the bladder, when a laceration might occur, if a slough did not; but the danger of extension of the injury would cease as soon as the slightest opening took place.

Having considered the value of an over-distended bladder as a factor in the production of vesico-vaginal fistula, with the degree of proportionate injury to the retentive power, we naturally pass to the study of the different modes of delivery as employed after greater or less delay.

The facts recorded in Table LVII. evidently show that instrumental delivery has but little to do with the formation of fistula. At the first glance it would appear that the extent of injury was due to the time of labor. This seems to be shown on taking, for instance, those delivered by forceps, where the time in labor is increased and the number of operations greater. It may be true that, under certain circumstances, the longer a woman is allowed to remain undelivered, the greater will be the risk of extensive injury to the soft parts. But, as a rule, it is a matter of doubt whether the extent of injury bears any relation whatever to the length of labor. This will be made evident after the most casual examination of the "abstract table of cases of vesico-vaginal fistula." Beginning with the first one of the record, where labor lasted but twenty-four hours, the result was such a destruction of tissue as to require twenty operations and three years of treatment to complete the restoration. Case No. 76 was in labor but eight hours and a half, and yet the sloughing was very extensive. On the other hand, Case No. 148 is shown to have been undelivered eight days, yet sustained comparatively slight damage; and so other cases might be cited.

TABLE LVII.—*Vesico-Vaginal Fistula: Mode of Delivery, Hours in Labor; No. of Operations required, Results.*

Number of operations............		1.	2.	3.	4.	5.	7.	8.	10.	14.	20.	Not given.	Cured.	Im-proved.	Not im-proved.	Died.	Result not given.	Total number.
Delivered with forceps.	No. of cases........	47	18	6	2	2	....	1	....	1	....	2	70	5	1	....	3	79
	Hours in labor.....	62.65	74.00	85.20	48.00	150.00	....	93.00	....	92.00	....	30.00	69 29	85.50	48.00	....	35.00	68.55
Ergot.	No. of cases........	3	1	1	....	....	....	....	....	....	1	....	6	....	....	....	....	6
	Hours in labor.....	79.00	81.00	24.00	....	....	....	....	....	....	24.00	....	61.66	....	....	....	....	61.66
Ergot and forceps.	No. of cases........	4	3	....	....	....	....	....	....	....	....	....	7	....	....	....	....	7
	Hours in labor	53.00	39.00	....	....	....	....	....	....	....	....	....	46.00	....	....	....	....	46 00
Craniotomy.	No. of cases........	10	3	1	....	....	....	....	....	....	....	....	11	2	....	1	....	14
	Hours in labor.....	49.25	64.33	60.00	....	....	....	....	....	....	....	....	47.77	57.00	....	103.00	....	62.25
Version and craniotomy.	No. of cases........	2	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	2
	Hours in labor.....	22.50	....	....	....	....	....	....	....	....	....	....	22.50	....	....	....	....	22.50
Version.	No. of cases........	2	1	....	....	....	....	....	....	....	....	....	3	....	....	....	....	3
	Hours in labor	13.00	1.00	....	....	....	....	....	....	....	....	....	9.00	....	....	....	....	9.00
Version and forceps.	No. of cases........	....	....	1	1	....	....	....	....	....	....	....	1	....	1	....	....	2
	Hours in labor.....	....	....	48.00	44.00	....	....	....	....	....	....	....	48.00	....	44.00	....	....	46.00
Embryotomy.	No. of cases........	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	2	2
	Hours in labor.....	....	27.00	....	....	....	....	....	....	....	....	20.00	...	....	....	....	23.50	23.50
Traction.	No. of cases........	5	3	....	....	1	....	....	....	....	....	....	9	....	....	....	....	9
	Hours in labor.....	97.00	60.00	....	....	30.00	....	....	....	....	....	....	77.22	....	....	....	....	77.22
By the unaided efforts of nature.	No. of cases........	21	6	3	2	....	....	....	1	1	....	....	27	4	2	....	1	34
	Hours in labor.....	42.81	62.33	27.00	30.00	...	....	....	48.00	48.00	....	....	50.91	30.00	26.00	....	48.00	44.44
Mode of delivery not stated.	No. of cases........	6	3	2	1	....	1	....	....	....	....	....	13	....	....	....	....	13
	Hours in labor.....	....	48.00	96.00	26.00	...	50.00	....	....	....	....	....	55.00	...	....	....	....	55.00
Total number for each operation		100	39	14	6	3	1	1	1	2	1	3	140	11	4	1	6	171

To establish, beyond question, the effect of instrumental delivery in these cases is a most important matter from a medico-legal point of view, since suits for malpractice have been instituted on the plea of damage sustained through want of dexterity on the part of the attending physician. A plea of this sort has been successfully prosecuted, proof being advanced that the urine escaped only at the moment of delivery, and, although the evidence might be conclusive to a jury, there exists, in reality, no connection whatever between the supposed cause and effect.

The damage is usually inflicted by the impaction of the child's head causing an obliteration of the circulation in the soft parts of the mother. Half an hour of this obstruction may cause the most extensive loss from sloughing. When the urine escaped at the moment of delivery the damage, with scarcely an exception to the rule, had already been done, and a slough formed, which became loosened only as the head was withdrawn.

I do not hesitate to make the statement that I have never met with a case of vesico-vaginal fistula, which, without doubt, could be shown to have resulted from instrumental delivery. On the contrary, the entire weight of evidence is conclusive in proving that the injury is a consequence of delay in delivery.

Since the loss is not in proportion to the length of the labor, as has been stated, and we cannot judge of the degree of impaction, there is but one safe course to adopt and that is to effect a speedy delivery. I have for years taught, that so long as the head recedes after a pain the patient can be in little danger, notwithstanding the time of labor may have been prolonged. The jeopardy to the patient begins from the moment when the head becomes stationary, and then the child should be removed as speedily as possible. Just as the head leaves the uterus and while the neck is still grasped there will of course be no recession for the moment. But the head in this condition is too low to cause damage at the superior strait, and has not yet reached the inferior one. The rule then is applicable when the head and shoulders have already escaped from the uterus, and the presenting part has begun to touch the floor of the pelvis. At this stage, when the head no longer recedes after each pain it is proof positive that the soft parts of the mother have lost their natural resiliency, and that delivery must be brought about speedily.

I do not pretend to lay down a fast rule for the experienced obstetrician as to the earliest period at which it is advisable to effect delivery, nor do I wish to advocate a more frequent use of instruments. These

	Cured.	Improved.	Not improved.	Died.
[illegible]	67 1[illegible]82	5 25.[illegible]	1 [illegible]	....
[illegible]	6 4.83	....	.... ..	.... .
[illegible]	7 12.42	.... .	....	
[illegible]	11 34.45	2 1[illegible]	....	1 .
[illegible]	2 [illegible]	... .	... .	.... ..
[illegible]	[illegible] 7.[illegible]	... .	.... ..	.... ..
[illegible]	1 [illegible]	....	.... ..	. ..
[illegible]	[illegible] 8.[illegible]	....	....	....
[illegible]	27 1[illegible]	2 [illegible]	2 [illegible]	.... ..
[illegible]	13 [illegible]	....	.. .	.... .
....	11[illegible]	[illegible]	3	1

who is familiar with the n
[illegible]tical experience, would do
. a case than would result if
own that the women who w
impaction of the head, susta
, those in whom labor was
[illegible]aided efforts of nature. I

the average duration of labor for the two classes of cases it would be natural to suppose that the destruction of tissue would be comparatively slight, and the time under treatment less for those who were delivered without aid. It is not within my province to enter into a discussion of the relative advantages of forceps and of the unaided efforts of nature for terminating tedious labors. But the fact cannot be questioned, nor can it be reiterated too often, that, after impaction has taken place, far more damage will result from leaving the head to be forced out by the action of the uterus, than would occur from any form of instrumental delivery. Table LVIII. clearly demonstrates this, if we accept, as an indication of the extent of injury, the average duration of treatment there shown to have been necessary before the injury was repaired. This is made even more clear in Table LIX., which does not include those aided by ergot, those left to nature, or those for whom the mode of delivery was not given. We have thus one hundred and ten women in whom labor was terminated by artificial means; and there is also shown the number of weeks they were under treatment. The average duration of treatment for one hundred women cured was 15.24 weeks, and for the total number regardless of the result it was 15.48 weeks. By reference again to Table LVIII. it will be seen that the average time under treatment for those who were cured after having been delivered by the efforts of nature was 19.63 weeks, and 21.37 weeks for all of this class who were under treatment. Thus, those who were cured were one month longer under treatment than those who were not cured, and required an additional operation. Those who were delivered by the efforts of nature averaged about six weeks longer under treatment than those who were delivered through artificial means.

Although the number who were delivered through the use of ergot alone is very small, as shown in Table LVIII., and the averages obtained from such would, under ordinary circumstances, be of little value, yet they are, in this connection, not without importance. If there is greater danger in allowing the delivery, after impaction, to be accomplished by dint of uterine contractions, it is shown to be still more so where these have been increased by use of ergot. There were six such cases, and they averaged over thirty-four weeks under treatment, in contrast to fifteen weeks, in round numbers, for the cases cured who had been delivered through artificial means. In other words, these cases were nearly five months longer under treatment than those delivered by instruments, and over three months longer than those who were left to the efforts of nature.

points must be determined by the [illegible] But it is well to establish some g[illegible] whose experience is more limited. [illegible] presented will be found to be a[illegible] of protracted parturition.

TABLE LVIII.—*Mode of Deli*[illegible] *Treatment, and the* [illegible] *Instruments.*

Mode of delivery.	
By forceps.	Number of cases ..... Av. time under treatm[illegible]
Ergot.	Number of cases ..... Av. time under treat[illegible]
Ergot and forceps.	Number of cases..... Av. time under treat[illegible]
Cranlotomy.	Number of cases .... Av. time under tre[illegible]
Version and craniotomy.	Number of cases ... Av. time under treat[illegible]
Version.	Number of cases .. Av. time under trea[illegible]
Version and forceps.	Number of cases . Av. time under tre[illegible]
Traction.	Number of cases . Av. time under t[illegible]
Efforts of nature	Number of case[illegible] Av. time under t[illegible]
Mode of delivery not given.	Number of case[illegible] Av. time under tr[illegible]
Total result of treatm[illegible]	

[illegible]	[illegible]ed.		Result not given		Total.	
[illegible]	Number of women.	Weeks under treatment.	Number of women.	Weeks under treatment.	Number of women.	Weeks under treatment.
		....	1	4	71	12[illegible]
	.	....	..	....	7	7
	1	6	..	....	11	16
..	..	....	..	....	2	1[illegible]
.	..	....	..	....	[illegible]	22
...	..	....	..	....	1	3[illegible]
...	..	....	..	....	[illegible]	7[illegible]
..	1	....	1	....	1[illegible]	
[illegible]	..	6	..	4	..	1[illegible]
[illegible]		6.00		4.00	1[illegible]	

[illegible] much of the prejudice which [illegible]very. While it may be true that [illegible] without any urgent necessity, still [illegible] of allowing labor to be too pro[illegible] [illegible] occur as the consequence of a

I have claimed that [illegible] about as soon as the head fails labor, although wanting [illegible] in applying the forcep[illegible] children are stillborn in labors were left unaided. It [illegible] This is shown in Table LX., and by means of instrum[illegible] about the same whether the child- damage to the soft [illegible] through the efforts of nature. The ergot, or terminated [illegible] cases was 62.39 hours. The again to Table LV[illegible] delivered without aid was 46.73 hours, labor for those wom[illegible] labor was terminated by artificial than that of those [illegible] both the time in labor and that number is greater [illegible] delivery, so that a comparison can the injuries occurr[illegible] labors in which fo[illegible] these stillborn children were of a re- those in which no [illegible] sixteen pounds each. The average on the total number, where the weight was stated, is a fraction over fourteen pounds, which is beyond question erroneous and exaggerated. The greater portion of these children were males, which are generally larger than female.

TABLE LX.—*Mode of Delivery, and Time under Treatment, for cases in which the Children were Stillborn.*

	No. of cases.	Total hours in labor.	Average No. of hours in labor.	Unusually large children.	No. of cases bladder emptied.	No. of cases bladder not emptied.	Average No. of hours urine retained.	No. of cases condition of bladder not stated.	No. of cases with escape of urine from delivery.	No. of cases with escape of urine later.	Av. time after labor at which urine began to escape (days).	Average time under treatment in weeks.
Forceps	34	2606	76.64	12	8	6	67.50	20	13	16	8.57	15.58
Ergot	5	320	64.00	4	..	4	86.25	1	3	1	2.00	41.00
Ergot and forceps	6	259	43.20	2	2	..	....	4	3	2	11.50	13.50
Craniotomy	13	695	53.33	4	2	4	57.25	7	6	6	10.16	15.00
Version and craniotomy	1	28	28.00	..	..	..	....	1	..	..	....	9.00
Version	2	26	13.00	..	1	..	....	1	2	..	....	7.50
Version and forceps	2	46	36.00	..	..	..	....	2				
Traction: delivery of body after birth of head	8	624	78.00	1	1	3	71.33	4	3	5	11.00	8.75
By the unaided efforts of nature	15	701	46.73	7	3	4	50.25	8	..	13	10.84	12.21
Total No.	86	..	62.39	30	17	21	66.33	48	30	43	9.87	15.45

A comparison can be made between Tables LX. and LV., in both of which the condition of the bladder during labor is noted. It is evident, although the record is so defective, that the bladder was not emptied in a large proportion of the women who bore these stillborn children. As the bladder was over-distended for over 66.33 hours on an average, we may readily conceive that the life of the child would thereby have been frequently lost in consequence of the greater force needed to terminate the labor. Table LVI. shows that the urine escaped at birth in 29.24 per cent., and after the elapse of a certain time in 40.93 per cent. of all women who suffered from vesico-vaginal fistula. Among the women who gave birth to dead children there were 34.88 per cent. where this loss of urine took place from the moment of delivery. On the other hand, with 50 per cent., the loss of control did not occur until after an average interval of 9.87 days from the time of labor, when a slough separated.

TABLE LXI.—*Showing the Labor in which the Injury was received, and the Number of Weeks under Treatment.*

		The number of weeks under treatment.																													Number for each labor.
		3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	16.	17.	18.	20.	22.	23.	26.	28.	32.	36.	52.	60.	78.	84.	104.	156.	260.	Time not given.	
In which labor injured.	First	6	13	5	5	4	9	1	...	...	7	...	...	2	1	2	2	1	1	6	...	3	2	1	1	4	1	...	1	1	6	85
	Second	...	6	2	2	1	...	2	2	...	3	...	1	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	2	24
	Third	2	3	...	1	...	1	...	...	...	1	...	...	1	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	11
	Fourth	...	2	1	...	1	2	...	1	...	1	3	...	1	...	...	1	...	...	1	...	...	...	2	...	...	...	...	...	...	...	16
	Fifth	...	1	...	1	1	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
	Sixth	...	3	...	...	...	...	1	2	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8
	Seventh	...	2	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
	Eighth	...	...	...	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	4
	Ninth	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
	Tenth	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
	Eleventh	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	3
	Fifteenth	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
	No record	...	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	4
Number for each period of treatment		8	30	10	10	9	15	6	7	2	12	3	1	9	1	2	6	2	1	8	1	3	3	4	1	4	1	1	1	1	9	171

The women giving birth to stillborn children were cured, on an average, in 15.45 weeks, which is less than that taken on the total number of women with fistula. Excepting for those delivered through the aid of ergot, these averages are all lower than the corresponding ones of the women who had given birth to living children. We have already made this comparison, showing that the women with whom the labors had been terminated through the efforts of nature were a shorter time in labor, but much longer under treatment than those delivered through artificial means.

If this is not due merely to the small number of this class the fact is almost inexplicable.

It is shown by Table LX. that the average time necessary for a woman to be under treatment, when she had borne a dead child through the efforts of nature, was nine weeks less than would be needed if she had given birth to a living child without assistance.

It can be readily understood that the risk of damage to the mother, is much less in the artificial delivery of a dead child than that of a living one from the possibility of its being compressed into a smaller mass.

But it is important to determine the stage of labor in which the death of the child occurred, for it is scarcely to be supposed that the unaided uterine efforts could expel a dead child with less damage to the soft parts of the mother, than would be inflicted by a living one.

Table LXI. is presented as a part of the history of the lesion, for the purpose of showing, in connection with the labor, the number of weeks these women with vesico-vaginal fistula were under treatment. Thus 6 women, injured in their first labor, and 2 in their third, were three weeks under treatment. At the other extreme, one case was 260 weeks, or over five years, under treatment before the injury could be repaired.

Of the total 171 cases, the largest number for any one period was 30 women, who were each four weeks under treatment.

We now naturally pass to consider the connection between the time in labor, the required number of operations, the period under treatment and the result. Thus by Table LXII. it will be seen that there were one hundred women who had but one operation.

Ninety of these were able to state with accuracy the time in labor (their average being 57.05 hours), while ten were unable to do so.

The average duration of treatment for one hundred was 8.38 weeks. Of these ninety-two who were cured averaged 8.30 weeks ; four were improved after a certain time ; two were not benefited ; one died ; and

Cases in which [illegible]

Average time [illegible]

Cases in which [illegible]

Number [illegible]

[illegible]

Cured

[illegible]

Average time [illegible]

Improved

Percentage

Average time under treatment (weeks)

Not improved

Percentage

Average time under treatment (weeks)

Died

Percentage

Average time under treatment (weeks)

Result unknown

Average time under treatment (weeks)

in one instance no record was made of the result of treatment. 58.53 per cent. had but one operation.

It is shown that one hundred and forty-nine cases, or 87.13 per cent. were cured, so many improved, not improved, etc. Finally for the total number of one-hundred and seventy-one cases of vesico-vaginal fistula, the average time under treatment for each was 17.32 weeks.

I have no reason to be dissatisfied with this result. A large number had been operated on before without success, and owing to the universal knowledge of this operation, none but the worst cases have for many years been sent to the Woman's Hospital. I claim, however, that we may confidently look for still better results by some 10 per cent., as the operation in all its details is being perfected daily. Only 2.33 per cent. of all the cases I have seen have proved incurable.

Two of these were rendered so from want of tissue, the uterus and whole vagina, and the entire tissues, except the periosteum behind the pubes and ramus, having sloughed away.

A third case, a negro woman, was sent to the Woman's Hospital by Dr. Wm. Geo. Thomas, of Wilmington, N. C., who had detected the difficulty before sending the case to me. A large exostosis existed behind the pubes, and somewhat under the arch, so that it had caused the urethra to be pushed to one side. This growth was the cause of the delay in labor, by which the whole urethra, with the tissues under the arch of the pubes, were lost. A transverse fistula existed at the neck of the bladder which could have been closed, but under the circumstances it was impossible to give her retentive power. The fourth case was a bad one, but could have been closed but from the fact that she was so excessively fat it was impossible even to bring the parts into view.

The eleven cases noted as simply improved, were every one cured, or could have been, after leaving the hospital, by some additional operator. The openings were caused by the accidental cutting out of some stitch, and in several instances, I am satisfied the opening closed by contraction. Finally, the single death resulted from advanced disease of the kidney, and the operation for closing the fistula was but the accident.

ABSTRACT OF CASES OF VESICO-VAGINAL FISTULA

Treated in the Woman's Hospital.

I.—Resulting from Childbirth.

The Roman numerals indicate the numbers given to the same in the author's monograph on Vesico-Vaginal Fistula.

1 (xxv.). *Admitted* Sept. 30, 1862. Age 30. Age at marriage 15. No. of children 1; of miscarriages 1.

History. In labor 36 hours; head born in 30 hours; body 14 hours afterwards; stillborn; the perineum torn; bladder not emptied for 84 hours.—*Extent of Lesion.* Base of bladder, cervix, and urethra destroyed; vagina shortened and contracted by a circular slough at the outlet.—*Treatment.* By 30 operations for opening the vagina, closing the fistula, and forming a new urethra.—*Duration of Treatment*, 3 years; *Result*, cured.—*Remarks.* Had cystitis 18 months afterwards; bladder opened, calculi removed, opening not closed again.

2 (xxviii.). *Admitted* Oct. 11, 1862. Age 25. Age at marriage 24. No. of children 1.

History. In labor 36 hours; natural delivery; failed in applying forceps; bladder not emptied; urine escaped from delivery.—*Extent of Lesion.* Loss of one-third of the base of the bladder in front of the cervix; fistula concealed; vagina shortened by anterior lip being drawn backward from contraction of cicatricial tissue in the posterior cul-de-sac.—*Treatment.* Cicatricial bands divided on each side, the vagina was lengthened an inch, and fistula brought into view; closed by 8 sutures; one operation.—*Duration of Treatment*, 4 weeks; *Result*, cured.

3 (xx.). *Admitted* Oct. 27, 1862. Age 30. No. of children 4.

History. In labor 74 hours; delivered by forceps; stillborn; no statement as to emptying the bladder; 17 days after delivery a slough was passed, and loss of urine followed.—*Extent of Lesion.* A triangular-shaped fistula, situated behind left ramus, extended across the vagina to the opposite side of the cervix; the edges were nearly in contact, but originally there had been great loss of tissue.—*Treatment.* To bring the opening into view and to close it, it was necessary to dissect its base free from the bone; one operation; 5 sutures; removed 9th day.—*Duration of Treatment*, 3 weeks; *Result*, cured.

4. *Admitted* Oct. 29, 1862. Age 33. Age at marriage 29. No. of children 1.

History. In labor 50 hours; bladder not emptied.—*Extent of Lesion.* Fistula extended from the middle of the urethra to the neck of the bladder.—*Complications.* Vagina contracted from a circular slough.—*Treatment.* 7 operations for opening the vagina, closing the fistula, and forming new urethra.—*Duration of Treatment*, 15 months; *Result*, cured.

5 (xxvii.). *Admitted* Nov. 24, 1862. Age 29. No. of children 7.

History. In labor 67 hours; natural delivery; stillborn; large child; bladder not emptied for 43 hours; urine escaped on the 8th day. Injured two years before admission.—*Extent of Lesion.* Loss of the whole base of the bladder; crescentic shaped fistula, with the corners drawn into the posterior cul-de-sac; cervix formed the posterior boundary.—*Complications.* Cervix lacerated from before backward.—*Treatment.* Fistula closed with 19 sutures; one operation; difficult on account of cicatricial edges; sutures removed 9th day.—*Duration of Treatment*, 4 weeks; *Result*, cured.

6 (xxxiv.). *Admitted* Dec. 11, 1862. Age 31. Age at marriage 19. No. of children 2; of miscarriages 2.

History. In labor 10 hours; forceps; child 12 pounds; bladder not emptied; injured one year before admission; urine escaped 3 weeks after delivery.—*Extent of Lesion.* Fistula oblique from the right of the cervix to the left of the neck of the bladder.—*Complications.* Pregnant 3 months when admitted.—*Treatment.* Extensive dissection of tissue necessary to free the edges; 8 sutures used; one operation; sutures removed 11th day.—*Duration of Treatment*, 5 weeks; *Result*, cured.

7. *Admitted* Feb. 3, 1863. Age 28. Age at marriage 24. No. of children 2.

History. In labor 36 hours: stillborn; progress arrested several hours; delivered by efforts of nature on changing position of head; bladder not emptied; slough passed 12th day; loss of urine afterwards; last labor three years before admission. —*Extent of Lesion.* Anterior lip of the uterus sloughed with fistula in front of it; on account of the position of the uterus and shortening of the vagina, after sloughing, the anterior wall formed a fold in front of the opening so that it could not be brought into view even on the knees and elbows.—*Complications.* Uterus retroverted and fixed by old cellulitis.—*Treatment.* Split the anterior wall of the vagina through the median line of the fold into the fistula, and closed all as one opening; closed all but a small opening near the uterus; several operations performed with great difficulty.—*Result,* improved.—*Remarks.* Never returned for final operation.

8 (xviii.). *Admitted* Feb. 7, 1863. Age 30. Age at marriage 19. No. of children 6.

History. Instrumental delivery after 67 hours in labor: pocket-knife and a blunt hook used; bladder emptied naturally; loss of urine from delivery. Injured five months previous to admission.—*Extent of Lesion.* Anterior lip lost and a large portion of the base of the bladder; by cicatricial tissue the vaginal wall was drawn into a fold so as to hide the fistula from view; the cervix projected into the bladder through the fistula.—*Complications.* Uterus retroverted and immovable from old cellulitis.—*Treatment.* As the uterus could not be moved, the crest of the fold was united to the posterior lip with 9 sutures; operation successful; afterwards, a small opening caused by traction; closed by another operation.—*Duration of Treatment,* 10 weeks; *Result,* cured.

9 (xii.). *Admitted* March 7, 1863. Age 40. Age at marriage 32. No. of children 2.

History. Injured in the second delivery; 71 hours in labor: completed by the efforts of nature; ergot; stillborn; bladder emptied; slough passed two weeks after delivery; loss of urine afterwards. Injured five years before admission.—*Extent of Lesion.* Laceration of the anterior lip in the median line, with sloughing of nearly two inches along the base of the bladder; the vaginal wall was drawn into a deep fold on each side of the fistula.—*Treatment.* The sides of the fold and of the tear through the cervix were united in common with the edges of the fistula; eleven sutures; line two inches and a half in length; sutures removed 10th day; one operation.—*Duration of Treatment,* 6 weeks; *Result,* cured.

10 (vi.). *Admitted* March 8, 1863. Age 32. Age at marriage 21. No. of children 6.

History. In labor 18 hours: delivered by version: stillborn; bladder emptied by catheter; urine escaped on the day after delivery; injured in the last labor; delivered by forceps in her previous labors.—*Extent of Lesion.* Laceration of the anterior lip of the cervix uteri and base of the bladder in the median line; partially closed by nature, leaving a sinus from the bladder communicating with the cervical canal above the vaginal junction.—*Complications.* Deep double laceration of cervix laterally from a previous labor.—*Treatment.* Cured by uniting the sides of the laceration and thus closing the os uteri.—*Duration of Treatment,* 9 weeks; *Result,* cured.—*Remarks.* Could now be cured by laying open the sinus, removing its walls, and then bringing the sides together with sutures, leaving the os open.

11. *Admitted* April 2, 1863. Age 28. Age at marriage 21. No. of children 5.

History. Injured in the fifth labor; 96 hours' duration: delivered with forceps; bladder not emptied for 60 hours.—*Extent of Lesion.* An opening an inch in diameter extending across the vagina and situated just in front of the cervix.—*Complications.* Cervix destroyed.—*Treatment.* Os turned into the bladder by uniting the anterior edge of the fistula to the posterior wall of the vagina; 14 sutures removed the 9th day.—*Duration of Treatment,* 8 weeks; *Result,* cured.—*Remarks.* Had been operated on three times previous to admission.

12 (xxxii.). *Admitted* April 13, 1863. Age 20. No. of children 1.

History. First pregnancy; in labor 90 hours: delivery by forceps; stillborn;

catheter passed regularly; escape of urine immediately after delivery.—*Extent of Lesion.* A transverse fistula in front of the cervix, an inch or more in length, had been closed by a previous operation, leaving a small opening admitting a probe. —*Complications.* An attempt had been made to close the fistula with the cautery, causing cicatricial tissue.—*Treatment.* Two operations; first was unsuccessful on account of the cicatricial edges; an opening one inch long made by removing this tissue at the second operation; 7 sutures, removed 9th day.—*Duration of Treatment*, 8 weeks; *Result*, cured.

13 (XLVIII.). *Admitted* April 27, 1863. Age 33. Age at marriage 27. No. of children 1.

History. In labor 5 days: delivered by forceps three years before admission: bladder emptied twice.—*Extent of Lesion.* A transverse fistula at the neck of the bladder, two inches in length; vagina only an inch deep, occluded above the fistula, retaining menstrual blood.—*Treatment.* Fistula closed by one operation with 8 sutures; vagina opened five times with the knife; succeeded by laceration. —*Duration of Treatment*, 21 months; *Result*, cured.—*Remarks.* History of case detailed in full in Chapter on Retained Menstruation, etc.

14. *Admitted* May 30, 1863. Age 32. Age at marriage 30. No. of children 1; of miscarriages 1.

History. In labor 36 hours: forceps; child very large; bladder not emptied.—*Extent of Lesion.* Fistula in the median line, one inch in length.—*Treatment.* One operation; 6 sutures, removed 8th day.—*Result*, cured.

15 (LI.). *Admitted* June 8, 1863. Age 32. Age at marriage 18. No. of children 2.

History. Second pregnancy; twins; 28 hours in labor: first delivered by breech; second by craniotomy.—*Extent of Lesion.* Fistula half an inch in diameter in the line of a former opening resulting from the first labor.—*Complications.* Antero-posterior diameter of pelvis 2⅜ inches; partial occlusion of the vagina.—*Treatment.* Vagina dilated by sponge-tents to close the fistula; 8 sutures; allowed to contract afterward, to prevent impregnation.—*Duration of Treatment*, 9 weeks; *Result*, cured.—*Remarks.* First fistula was closed by Dr. Emmet, July, 1862.

16 (LVI.). *Admitted* Oct. 1, 1863. Age 30. Age at marriage 24. No. of children 4.

History. In labor 44 hours: natural delivery after ergot; child very large; stillborn; bladder was emptied regularly; loss of urine after 24th day.—*Extent of Lesion.* Triangular-shaped opening behind the left ramus.—*Treatment.* Closed with great difficulty by 6 sutures; removed 8th day.—*Duration of Treatment*, 4 weeks; *Result*, cured.

17 (LXVI.). *Admitted* Oct. 1, 1863. Age 38. Age at marriage 14. No. of children 8.

History. In labor 84 hours: delivered by forceps, after ergot; no recollection of emptying the bladder; urine lost after the 7th day.—*Extent of Lesion.* Loss of one-third of the lower portion of the vagina just beyond the neck of the bladder, but by contraction of the vagina the edges lay almost in contact, and extended from one ramus to the other.—*Complications.* Rectal fistula.—*Treatment.* Closed the opening with 11 sutures; removed on the 8th day; required several months of preparatory treatment before operation.—*Result*, cured.

18. *Admitted* Oct. 5, 1863. Age 41. Age at marriage 28. No. of children 4; of miscarriages 3.

History. In the last labor 1 hour: foot presentation; delivered by version.—*Extent of Lesion.* Fistula small; laceration through the anterior lip of the cervix. —*Treatment.* By two operations.—*Duration of Treatment*, 7 weeks; *Result*, cured.

19 (XLIV.). *Admitted* Oct. 7, 1863. Age 35. Age at marriage 14. No. of children 5; of miscarriages 1.

History. Injured in the 4th labor, of 7 hours: natural delivery; placenta retained 12 hours; urine escaped from time of delivery; 7 years previous to admission; last child 5 years after.—*Extent of Lesion.* Loss of the entire base of the bladder, with bands extending from each side of the cervix to the pubes; vagina shortened, the cervix being near the neck of the bladder, and fistula contracted to an inch in diameter.—*Complications.* Neck of the uterus drawn into the bladder by contraction of cicatricial bands.—*Treatment.* First operation successful, with 7 sutures; afterwards an opening as large as a probe occurred behind the right ramus; second operation unsuccessful; third one successful by dissecting the tissues free from the face of the ramus.—*Duration of Treatment,* 13 weeks; *Result,* cured.

20 (LIII.). *Admitted* Oct. 18, 1863. Age 32. Age at marriage 20. No. of children 6.

History. In labor 115 hours: forceps; child stillborn and very large; urine escaped from the time of delivery. Injured six months previous to admission.—*Extent of Lesion.* Fistula in front of the uterus large enough to admit the index finger.—*Complications.* Vagina narrowed to admit only a probe to the depth of an inch and a half; cul-de-sac destroyed; uterus retroverted and bound down by adhesions.—*Treatment.* Vagina opened by two operations; fistula closed by one operation and 6 sutures transverse to the axis of the vagina; removed 9th day.—*Duration of Treatment,* 10 weeks; *Result,* cured.

21 (LII.). *Admitted* Oct. 20, 1863. Age 22. Age at marriage 20. No. of children 1.

History. In labor 51 hours: ergot and forceps; stillborn; some urine lost two days after delivery; no control after three weeks, when a slough was passed. Delivered three months before admission.—*Extent of Lesion.* Fistula just in front of the cervix; there had been great loss of tissue, but now contracted to the size of No. 12 bougie; cicatricial edges.—*Complications.* Vagina shortened and partially occluded by bands in front of and concealing the fistula.—*Treatment.* With the edges of the fistula, one-third of an inch of surrounding tissue was removed; 6 sutures used; there was so little bleeding after finding the bands that a plug was not needed and the operation was done at the same time.—*Duration of Treatment,* 7 weeks; *Result,* cured.

22 (LIX.). *Admitted* Nov. 27, 1863. Age 35. Age at marriage 28. No. of children 4.

History. In labor 102 hours: delivered by forceps; stillborn child, under the average size; bladder not emptied; escape of urine from delivery. Injured fourteen months before admission.—*Extent of Lesion.* Very large circular slough; narrowing of vagina; loss of part of urethra; cicatricial bands, extending from under the pubis downward and backward to the recto-vaginal septum, formed two folds beneath which was a small opening into neck of bladder.—*Treatment.* Fistula closed without dividing the bands, for had this been done, incontinence of urine would have resulted, as the neck of the bladder was lost; 6 sutures used; removed on the 14th day; cured by one operation.—*Duration of Treatment,* 8 weeks; *Result,* cured.

23 (XLII.). *Admitted* Dec. 18, 1863. Age 25. Age at marriage 23. No. of children 1.

History. In labor 105 hours: forceps; child very large and stillborn; bladder not emptied; urine escaped 4 days after delivery. Injured five months before admission.—*Extent of Lesion.* Loss of the left half of the base of the bladder; semicircular opening two inches long and one wide.—*Treatment.* Fistula closed by one operation; 10 sutures; the difficulty was in passing the sutures to radiate from a common centre, so that two different arcs of a circle could be brought together without puckering.—*Duration of Treatment,* 6 weeks; *Result,* cured.

24 (XXXVII.). *Admitted* Jan. 28, 1864. Age 40. Age at marriage 28. No. of children 4.

History. In labor 105 hours: forceps; child large and stillborn; bladder frequently emptied; urine escaped from time of delivery. Injured seven years previous to admission.—*Extent of Lesion.* Loss of the whole base of the bladder; the inner face of the left ramus divided.—*Treatment.* Fistula closed by three progressive operations; it was necessary to dissect up the tissues freely to free the edges.—*Duration of Treatment,* 3 months; *Result,* cured.

25. *Admitted* Feb. 2, 1864. Age 26. Age at marriage 24. No. of children 1.
History. In labor 5 days: delivered by forceps; bladder emptied naturally; admitted ten days after delivery.—*Extent of Lesion.* An opening in the centre of the base of the bladder admitting the index finger.—*Complications.* Rectal fistula. —*Treatment.* Fistula closed in three weeks by the frequent use of hot water, vaginal injections, and without an operation.—*Duration of Treatment,* 3 weeks; *Result,* cured.

26 (lxviii.). *Admitted* Feb. 2, 1864. Age 27. Age at marriage 19. No. of children 1.
History. In labor 65 hours: delivered by efforts of nature; bladder not emptied until 24 hours after delivery; urine then lost for several weeks, when she regained retentive power for a time. Injured two years.—*Extent of Lesion.* The opening into the bladder was not suspected until after dividing some cicatricial bands, when the tension being relieved the urine continued to escape from a fistula behind the left ramus, admitting a No. 12 bougie.—*Complications.* Rectal fistula. *Treatment.* Fistula closed without difficulty with 8 sutures and by one operation.—*Duration of Treatment,* 6 weeks; *Result,* cured.

27 (vii.). *Admitted* April 4, 1864. Age 26. Age at marriage 21. No. of children 3.
History. In labor 37 hours: natural delivery; stillborn; weighed 12 pounds; the bladder was not emptied; injured 21 months; urine lost after the 14th day. —*Extent of Lesion.* A sinus from the bladder entered the cervical canal above the vaginal junction, from a laceration of the cervix through the anterior lip, in the median line, which had united from above, leaving the sinus at the bottom of the tear.—*Treatment.* Reproduced, with a pair of scissors, the original condition, then obliterated the tract of the sinus; surfaces were brought together by 5 sutures at one operation.—*Duration of Treatment,* 4 weeks; *Result,* cured —*Remarks.* Had been operated on twice before admission, and with benefit.

28 (xvi.). *Admitted* April 10, 1864. Age 27. Age at marriage 24. No. of children 1.
History. In labor 104 hours: natural delivery; very large child, stillborn; the bladder was not emptied until after delivery; began to lose control after two weeks. Injured two years.—*Extent of Lesion.* Loss of two-thirds of the base of the bladder in front of the cervix, with the posterior lip and cul-de-sac; fistula from one ramus to another, with receding edges. A false passage had been made from the urethra about a third of an inch in front of the fistula.—*Complications.* Angle of the fistula on the right side; the surrounding parts were a mass of cicatricial tissue; urethra impervious, with a false opening into the vagina. —*Treatment.* First operation was to open the urethra; a week after, closed the fistula with 14 sutures; successful; a small opening afterwards from tension, which was closed by a subsequent operation.—*Duration of Treatment,* 9 weeks; *Result,* cured.

29 (xxii.). *Admitted* April 27, 1864. Age 33. Age at marriage 27. No. of children 2; of miscarriages 1.
History. In labor 70 hours: delivered by forceps; child stillborn; 10 pounds; the bladder was not emptied until by catheter before applying the forceps; urine escaped a week after delivery. Injured thirty-four months.—*Extent of Lesion.* Anterior lip lost, with a large portion of the bladder, forming a transverse fistula from one side of the vagina to the other; nature attempted to close the fistula by uniting a portion of its anterior edge to the posterior lip of the uterus and vaginal wall on a line with the cervix; in this line two openings were left, one small, the other admitting the finger.—*Treatment.* Nature had shut the mouth of the uterus up within the bladder, and this effort was completed; 9 sutures were used for the larger opening, and 3 for the smaller one; they were removed on the 8th day.—*Duration of Treatment,* 5 weeks; *Result,* cured.

30 (xiii.). *Admitted* May 24, 1864. Age 24. Age at marriage 22. No. of children 1.
History. In labor 50 hours: delivered by forceps; large child, stillborn; bladder emptied regularly; a slough passed on the 19th day; loss of urine after-

wards. Injured two months.—*Extent of Lesion.* A slough had extended from the cervix to the neck of the bladder; by healing from both ends, the fistula contracted to a circular opening, only large enough to admit the index finger, and was situated in the centre of the base of the bladder.—*Complications.* Laceration of the anterior lip.—*Treatment.* Two parallel incisions were made on each side of the fistula, through the cicatricial tissue, and these surfaces were united by 7 sutures; removed on the 9th day.—*Duration of Treatment,* 8 weeks; *Result,* cured.

31 (x.). *Admitted* June 3, 1864. Age 40. Age at marriage 26. No. of children 9.

History. Labor 42 hours: ergot, forceps; large stillborn child; bladder not emptied; urine lost from delivery. Injured three months.—*Extent of Lesion.* Lateral laceration into the bladder through the cervix on the right side; opening large enough to admit two fingers.—*Treatment.* First operation not entirely successful; 9 sutures were used; readmitted, and by second operation closed, using 9 sutures.—*Duration of Treatment,* 8 weeks; *Result,* cured.

32 (xxx.). *Admitted* Sept. 16, 1864. Age 36. No. of children 1.

History. Puerperal convulsions on the 3d day; in labor 96 hours: forceps; stillborn; unable to give any information regarding the bladder; escape of urine two weeks after delivery. Injured eleven months.—*Extent of Lesion.* Loss of the upper third of the base of the bladder; by cicatrization and shortening of the vagina, the opening reduced in size so as to admit the point of a large sound.—*Complications.* Great extent of cicatricial tissue.—*Treatment.* A concave incision was made in healthy tissue half an inch from the neck of the bladder and around the fistula; the cicatricial edges were removed; closed by 9 sutures.—*Duration of Treatment,* 6 weeks; *Result,* cured.

33 (xli.). *Admitted* Oct. 10, 1864. Age 46. Age at marriage 21. No. of children 10.

History. In last labor 95 hours: ergot; delivered "by hand;" child had been dead some time; bladder not emptied for 83 hours; loss of urine from delivery. Injured four years and a half.—*Extent of Lesion.* Loss of the right half of the base of the bladder; by contraction, the vagina was shortened and the fistula reduced to less than an inch in size and hidden at the bottom of two deep folds.—*Treatment.* Edges of the fistula were cicatricial; these were denuded with the sides of the folds and brought together by 16 sutures.—*Duration of Treatment,* 5 weeks; *Result,* cured.

34 (xxxiii.). *Admitted* Oct. 11, 1864. Age 31. Age at marriage 21. No. of children 4.

History. Chloroform; 21 hours in labor: delivered by forceps; child 16 pounds; stillborn; bladder was emptied; loss of urine from delivery; confined to her bed several months. Injured 41 months.—*Extent of Lesion.* Loss of the whole base of the bladder; the fistula was more than three inches in length, and extended obliquely to the right across the axis of the vagina, from contraction of bands in the posterior cul-de-sac.—*Complications.* The mouth of each ureter was in the edge of the fistula; uterus immovable.—*Treatment.* After division of bands in the cul-de-sac, the fistula was closed by 20 sutures; successful; twice afterwards, by traction, openings were made and finally closed.—*Duration of Treatment,* 18 weeks; *Result,* cured.—*Remarks.* Had been operated on twice previous to admission.

35 (xliii.). *Admitted* Oct. 14, 1864. Age 31. Age at marriage 22. No. of children 2.

History. In labor 90 hours: delivered by efforts of nature after the use of ergot; bladder not emptied: urine escaped from delivery; legs paralyzed for several weeks. Injured three years and a half.—*Extent of Lesion.* The left half of the base of the bladder was lost by sloughing, with the neck of the uterus and posterior cul-de-sac; the vagina was shortened and narrowed, with occlusion of the uterine canal; uterus atrophied.—*Treatment.* Fistula, after much difficulty, was closed by 19 sutures; on removing the sutures, a small opening was made, which closed by subsequent operation; another small opening closed by contraction.—*Duration of Treatment,* 12 weeks; *Result,* cured.

36 (XXXIX.). *Admitted* Oct. 17, 1864. Age 27. Age at marriage 25. No. of children 1.

History. In labor 224 hours: delivered by forceps; was not in charge of a physician until the 8th day; the child was large and in a putrid condition; during labor the bladder was emptied, but "for a number of days after" the urine was retained, and suddenly escaped in a large quantity. Injured seventeen months before admission.—*Extent of Lesion.* Loss of the whole base of the bladder, the cervix uteri, and cul-de-sac, with the inverted bladder protruding through the fistula in the midst of cicatricial tissue; this tissue was chiefly from the ramus on the right side, along the edge of the fistula, on the lateral wall, into the cul-de-sac, binding down the remains of the cervix uteri.—*Treatment.* The cicatricial band was divided in several places, and the cervix freed from adhesions; the glass plug was used; from the character of the tissue it required five operations before the opening was bridged over.—*Duration of Treatment*, 9 months; *Result*, cured.

37. *Admitted* Oct. 27, 1864. Age 31. Age at marriage 22. No. of children 4.

History. In labor 24 hours: delivered by forceps; child stillborn, and weighed 16 pounds; the bladder was emptied regularly.—*Extent of Lesion.* Loss of the entire base of the bladder and cervix, with the uterus bound down by adhesions.—*Treatment.* The great difficulty was in freeing the edges by extensive dissection; the fistula was closed after four operations.—*Duration of Treatment*, 12 months; *Result*, cured.

38. *Admitted* Nov. 5, 1864. Age 35. Age at marriage 23. No. of children 1.

History. In labor 44 hours: version, and head delivered by forceps; the bladder had been emptied.—*Extent of Lesion.* Loss of the base of the bladder and urethra, with the sub-pubic tissue; inner face of both rami denuded.—*Complications.* "Hour-glass" constriction of the vagina from a circular slough.—*Treatment.* Four operations; *Result*, not improved.

39 (LIV.). *Admitted* Nov. 5, 1864. Age 29. Age at marriage 27. No. of children 1.

History. In labor 15 hours: ergot; forceps; stillborn; large size; the bladder was frequently emptied; loss of urine from time of delivery; confined to bed two months.—*Extent of Lesion.* The vagina was almost closed throughout its length, with loss of the cul-de-sac; vagina opened by scissors, laceration, and the knife; the fistula was found situated immediately behind the left ramus.—*Complications.* Contraction of the vagina.—*Treatment.* Vagina opened, and patient returned home wearing a glass plug; readmitted; vagina deepened; 6 months after, fistula closed, small opening left, closed by a second operation.—*Duration of Treatment*, 6 months; *Result*, cured.

40 (LVII.). *Admitted* Nov. 10, 1864. Age 42. Age at marriage 32. No. of children 6.

History. Chloroform; in labor 12 hours: breech delivered "by traction;" child dead; bladder not emptied; urine lost two weeks after delivery; confined to bed two months.—*Extent of Lesion.* The fistula was situated behind the right ramus, lessened in size by the contraction of cicatricial tissue, and the vagina shortened so as to form a cystocele; the opening was large enough to admit the index finger.—*Treatment.* A broad oval surface was removed around the fistula, so as to extend to the right of the cervix; 17 sutures were introduced, and the fistula closed on bringing together the parts for the removal of the cystocele.—*Duration of Treatment*, 4 weeks; *Result*, cured.

41 (I.). *Admitted* Nov. 29, 1864. Age 44. Age at marriage 18. No. of children 15; of miscarriages 1.

History. In labor 133 hours: child removed by traction; stillborn; weighed 14 pounds; the bladder was not emptied for a great portion of the time; escaped on the 9th day after delivery.—*Extent of Lesion.* An antero-posterior laceration of the cervix uteri, with a fistula extending in the median line from the cervix to the neck of the bladder.—*Complications.* Cicatricial tissue on the edges and joining vaginal surface.—*Treatment.* Two long incisions were made through the cicatricial surface, and these surfaces were brought together in connection with the laceration through the cervix; 10 sutures were used.—*Duration of Treatment*, 10 weeks; *Result*, cured.—*Remarks*. Stone removed from the bladder eighteen months after operation.

42 (LXV.). *Admitted* Nov. 30, 1864. Age 30. Age at marriage 22. No. of children 2.

History. In labor 92 hours: delivered with forceps; bladder not emptied for 24 hours before delivery; placenta retained three days; on its removal, lost control of the urine; confined to bed for two months. Injured fifty months before admission.—*Extent of Lesion*. Loss of the whole base of the bladder, the cervix uteri, and laceration in the median line almost to the vesico-uterine junction, with destruction of the neck of the bladder and nearly the whole urethra; the uterus was immovable and drawn to the right side.—*Treatment*. After eleven operations the fistula was bridged over; a new urethra was made throughout, and after three additional operations she was discharged, with voluntary retentive power.—*Duration of Treatment*, 2 years; *Result*, cured.

43 (XLVI.). *Admitted* Dec. 2, 1864. Age 19. Age at marriage 18. No. of children 1.

History. In labor 81 hours: ergot; bladder not emptied; large child; stillborn; urine escaped from time of delivery. Injured fifteen weeks.—*Extent of Lesion*. Two fistulæ, one near the neck of the bladder to the right, and the other near the cervix on the same side; there had been lateral laceration of the cervix, with sloughing.—*Complications*. Vagina shortened by bands from the lower fistula across to the left side of the vagina around into the cul-de-sac to the upper opening.—*Treatment*. The band had to be extensively divided, and each fistula was closed by a single operation.—*Duration of Treatment*, 4 months; *Result*, cured.

44 (LXIII.). *Admitted* Dec. 8, 1864. Age 23. No. of children 1.

History. In labor 98 hours: ergot; breech presentation; "instrumental" delivery; child stillborn; 12 pounds; bladder not emptied until just before delivery; urine began to escape on the second day afterwards. Injured about four years.—*Extent of Lesion*. There had been a slough under the arch of the pubes entirely across the vagina, which destroyed the neck of the bladder; after cicatrization an opening was left at the neck of the bladder only large enough to admit a No. 12 bougie; a semilunar shaped band extended from each side of the fistula down on to the posterior wall, so as to contract the vagina.—*Complications*. Occlusion of the urethra.—*Treatment*. The bands were cut and a new urethra made by puncture; a tube was retained in the false passage some ten days, until healed; a month after, the fistula was closed by 5 stures.—*Duration of Treatment*, 2 months; *Result*, cured.

45 (XXXV.). *Admitted* Dec. 21, 1864. Age 32. Age at marriage 25. No. of children 4.

History. Puerperal convulsions: delivered by forceps, after a labor of 51 hours; stillborn; not known if the bladder was emptied; urine did not escape until 3 weeks after delivery: confined to the house for six months after. Injured five years previous to admission.—*Extent of Lesion*. Loss of the entire base and neck of the bladder; at each angle the edges sloped inward, so that opening was but an inch and a quarter long by an inch in width; the tissue in front of the fistula was thrown into numerous folds like a cystocele; vagina shortened, and this mass hid the anterior lip of the fistula.—*Complications*. Extensive cicatricial bands from in front of the fistula to the urethral outlet, backward along the angles to the lateral walls into the cul-de-sac.—*Treatment*. The fistula was closed by bridging over the opening with the cystocele, thus turning the vaginal tissue into the bladder; by this means traction was not made on the shortened urethra.—*Duration of Treatment*, 4 weeks; *Result*, cured.

46 (LXVII.). *Admitted* Feb. 12, 1865. Age 23. Age at marriage 21. No. of children 1.

History. Time of labor and condition of the bladder unknown; delivered by craniotomy a year before first examination.—*Extent of Lesion*. Loss of the greater portion of the neck and base of the bladder, but the vagina had become shortened by contraction, so that the sides of the fistula lay in contact at the bottom of a sutures were used.-

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Age at marriage 28. No.
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the opening became a transverse one in front of the cervix.—*Complications*. Vagina shortened by contraction.—*Treatment*. The edges were secured by 14 sutures, as they lay nearly in contact.—*Duration of Treatment*, 4 weeks; *Result*, cured.

54 (III.). *Admitted* Oct. 4, 1865. Age 37. Age at marriage 19. No. of children 5; of miscarriages 1.

History. Labor 45 hours' duration: delivered by forceps; child stillborn and of a large size; bladder was not emptied, although the attempt had been made; loss of urine from delivery. Injured six months.—*Extent of Lesion*. There had been laceration of the cervix through the anterior lip into the base of the bladder, leaving a fistula in the median line one inch in diameter.—*Complications*. Uterus retroverted.—*Treatment*. The opening was irregular in shape and difficult on this account to be brought together; 9 sutures were used; removed on the 11th day. —*Duration of Treatment*, 4 weeks; *Result*, cured.

55 (IV.). *Admitted* Oct. 5, 1865. Age 26. No. of children 1.

History. In labor 72 hours: natural delivery; bladder emptied; child stillborn and of a large size. Injured about seven years.—*Extent of Lesion*. A small circular opening, an eighth of an inch in diameter, in front of the cervix, caused by a laceration through the anterior lip.—*Treatment*. Cut through the cervix to produce the original condition, then united all by 9 sutures.—*Duration of Treatment*, 7 weeks; *Result*, cured.

56. *Admitted* Jan. 23, 1866. Age 24. Age at marriage 22. No. of children 1.

History. In labor 4 days, and delivered by forceps; child stillborn; no information given in relation to the bladder.—*Extent of Lesion*. Fistula in the median line and centre of the base of the bladder, half an inch in diameter.—*Complications*. Recto-vaginal fistula.—*Treatment*. One operation; 8 sutures used and removed on the 8th day.—*Duration of Treatment*, 7 weeks; *Result*, cured.

57 (XL.). *Admitted* Feb. 21, 1866. Age 20. Age at marriage 17. No. of children 1.

History. In labor 24 hours: natural delivery; child 14 pounds; stillborn; on the 3d day the urine began to escape. Injured eleven months.—*Extent of Lesion*. Loss of nearly the whole base of the bladder, a portion of the neck of the uterus, and the cul-de-sac; the fistula crescentic in shape, and the vagina shortened by contraction to an inch and a half, from sloughing.—*Treatment*. After a preparatory operation for enlarging the vagina and dividing the bands, the fistula was closed by two operations, using 16 sutures at one time, and 11 at the other.—*Duration of Treatment*, 17 weeks; *Result*, cured.—*Remarks*. Had been operated on previous to admission.

58 (XXXVIII.). *Admitted* April 3, 1866. Age 27. Age at marriage 25. No. of children 1.

History. In labor 58 hours: delivered by forceps; stillborn; 5 weeks previous to admission; no information in regard to emptying the bladder; urine began to escape on the 2d day.—*Extent of Lesion*. A fistula involving the loss of the whole base of the bladder, with the face of each ramus nearly denuded; the inverted bladder, with a portion of the intestines, frequently became partially strangulated by protruding through the fistula.—*Treatment*. The bands were freely divided and the edge of the fistula dissected off from the inner face of the right ramus; the edges were then closed, from the left ramus to the right of the cervix, by 11 sutures.—*Duration of Treatment*, 8 weeks; *Result*, cured.

59 (XXIX.). *Admitted* Sept. 26, 1866. Age 30. Age at marriage 26. No. of children 3.

History. Delivered by forceps: 30 hours in labor; 7 days after the birth of her child the urine escaped by a sudden gush, while walking about her room. Injured three months.—*Extent of Lesion*. Loss of the upper half of the base of the bladder with a lateral laceration of the cervix by a previous labor; the fistula was crescentic in shape, with its cornua extending into the cul-de-sac, and the anterior lip of the uterus formed its posterior boundary.—*Treatment*. The bands were divided so that the fistula became a transverse one, into which three fingers could be passed; closed by 14 sutures, which were removed in 2 weeks.—*Duration of Treatment*, 6 weeks; *Result*, cured.

60 (xvii.). *Admitted* Sept. 27, 1866. Age 29. Age at marriage 19. No. of children 6.

History. Labor terminated naturally in 48 hours; nothing of note during its progress; 2 days after, the urine began to escape.—*Extent of Lesion.* Transverse fistula in front of the cervix, which had sloughed away; by bands extending into the cul-de-sac, the vaginal tissue in front of the cervix was drawn into a fold so as to hide the opening into the bladder.—*Treatment.* The fold was freed, so as to bring the fistula into view; its edges were very thin, so that the vaginal tissue was also denuded; closed by 10 sutures; removed on the 10th day.—*Duration of Treatment*, 4 weeks; *Result*, cured.

61 (xix.). *Admitted* Oct. 1, 1866. Age 28. Age at marriage 19. No. of children 5.

History. In labor 48 hours: delivered by forceps; 2 weeks afterwards the urine began to escape; made a tedious recovery.—*Extent of Lesion.* Sloughing of the anterior lip and a portion of the base of the bladder, in front of the cervix, took place; by shortening of the vagina, its anterior wall became doubled on itself, so as to form a fold which hid the fistula.—*Complications.* Laceration of the posterior lip backwards, with subsequent pelvic cellulitis and retroversion of the uterus.—*Treatment.* The operation was a very difficult one, as the fistula could not be brought into view; closed chiefly by the sense of touch; occupied two hours.—*Duration of Treatment*, 10 weeks; *Result*, cured.

62. *Admitted* Oct. 17, 1866. Age 24. Age at marriage 18. No. of children 4.

History. In last labor 30 hours: natural delivery; no further particulars given.—*Extent of Lesion.* Two-thirds of the lower portion of the base of the bladder was lost, leaving a transverse fistula from ramus to ramus.—*Treatment.* 4 operations.—*Duration of Treatment*, 11 weeks; *Result*, cured.

63. *Admitted* Nov. 19, 1866. Age 30. Age at marriage 29. No. of children 1.

History. In natural labor 48 hours; no further particulars given.—*Extent of Lesion.* Originally had lost the whole base of the bladder, but from firm traction of cicatricial bands opening became oblique and was one inch and a half in length and an inch wide.—*Complications.* Urethra occluded.—*Treatment.* 5 operations; one for division of bands, one to open the urethra, and three to close the fistula.—*Duration of Treatment*, 1 year; *Result*, improved.—*Remarks.* A small opening left; she did not return, and it was doubtless closed by some one else.

64 (v.). *Admitted* Nov. 26, 1866. Age 36. Age at marriage 26. No. of children 4.

History. Injured in the last labor, 5 weeks previous to admission; 48 hours in labor and delivered by "traction;" stillborn; loss of urine from time of delivery.—*Extent of Lesion.* A fistula in the median line extending an inch and a quarter from the cervix towards the neck of the bladder, and had resulted from a laceration of the anterior lip of the cervix; the fissure was deeper in the uterine canal than on a line with the opening through the vaginal septum.—*Treatment.* First operation successful; on the day after removal of sutures jumped out of bed from fright, and the urine was found to escape from the os uteri; reproduced the condition at the time of laceration, with a successful result.—*Duration of Treatment*, 13 weeks; *Result*, cured.

65 (l.). *Admitted* Jan. 19, 1867. Age 36. Age at marriage 19. No. of children 1.

History. In labor 48 hours, and delivered by forceps: child stillborn; no recollection in regard to emptying the bladder; the urine began to escape at the end of first week. Injured fifteen years.—*Extent of Lesion.* The whole base of the bladder was found to have been lost and the cul-de-sac and the vagina shortened to an inch and a half in depth.—*Complications.* The vaginal outlet contracted by a slough behind the perineum so that the finger could not be introduced.—*Treatment.* The vagina was opened to the depth of three inches and the fistula closed; shortly after the sutures had been removed, an opening was found behind the right ramus; 15 sutures used at first and 5 afterwards.—*Duration of Treatment*, 12 weeks; *Result*, cured.

66. *Admitted* Jan. 24, 1867.

History. No record.—*Extent of Lesion.* A fistula admitting the finger situated in front of the cervix and caused by an anterior laceration.—*Treatment.* 1 operation; 6 sutures; removed 12th day.—*Duration of Treatment,* 5 weeks; *Result,* cured.

67 (LXI.). *Admitted* Feb. 4, 1867. Age 38. Age at marriage 27. No. of children 2.

History. In labor 62 hours: delivered by forceps; stillborn; the bladder was not emptied; urine escaped from time of delivery.—*Extent of Lesion.* The whole base of the bladder lost, but became greatly reduced in size by opening contraction.—*Complications.* Cicatricial tissue shortening the vagina.—*Treatment.* 2 operations; the first with 10 sutures failed from traction; band divided; second operation successful, with 9 sutures.—*Duration of Treatment,* 10 weeks; *Result,* cured.—*Remarks.* Fistula had been closed before admission, but opened from traction of bands.

68 (XXIV.). *Admitted* March 5, 1867. Age 38. Age at marriage 18. No. of children 5.

History. Natural labor 56 hours: bladder had been frequently emptied; urine began to escape on the 9th day.—*Extent of Lesion.* Loss of the anterior lip of the cervix and upper third of the base of the bladder; the vaginal tissue was drawn backward like a hood, so as to hide the fistula.—*Treatment.* The fistula was closed, but no union took place, as its edges were cicatricial; second operation successful by cutting out the surrounding tissue, and bringing together healthy surfaces.—*Duration of Treatment,* 7 weeks; *Result,* cured.

69 (XLIX.). *Admitted* April 5, 1867. Age 34. Age at marriage 32. No. of children 1.

History. No labor pains: delivered by forceps six days after rupture of the membranes; the bladder was not emptied, although the attempt was made; loss of urine from delivery; confined to bed 4 months when she was admitted to the Hospital.—*Extent of Lesion.* The vagina was narrowed at the depth of an inch and a half, a transverse fistula beyond, with perfect occlusion of the canal at the posterior edge of the opening; the vagina was opened for over three inches in depth without detecting the position of the uterus.—*Treatment.* The fistula into the bladder was closed after two operations, by bringing together the tissue along the axis of the vagina in two folds and shutting up the fistula at the bottom of a pouch.—*Duration of Treatment,* 23 weeks; *Result,* cured.

70 (XXV.). *Admitted* April 12, 1867. Age 27. Age at marriage 23. No. of children 3.

History. In labor 46 hours: delivered by forceps; stillborn; bladder was emptied; loss of urine 2 weeks after delivery. Injured ten months before admission.—*Extent of Lesion.* Loss of the anterior lip of the cervix and upper portion of the base of the bladder; by contraction, the vaginal tissue was drawn laterally into two folds over the cervix and fistula, and these extended in the long axis of the canal, from the cul-de-sac nearly to the neck of the bladder.—*Treatment.* These bands were dissected off from the posterior lip, so that the fistula was brought into view and easily closed by 9 sutures; removed the 11th day.—*Duration of Treatment,* 4 weeks; *Result,* cured.

71 (LXII.). *Admitted* April 27, 1867. Age 18. Age at marriage 16. No. of children 1.

History. The head was born at the end of 74 hours: pains then ceased; body delivered 15 hours after by traction; stillborn; the bladder had not been emptied for 48 hours previous to delivery; 4 days after, it began to escape.—*Extent of Lesion.* The urethra was lacerated entirely through, half an inch from the meatus; the distal portion of the canal was so dilated that a large portion of the mucous membrane protruded.—*Treatment.* The difficulties of the operation consisted in passing the sutures so as to bring perfectly into apposition the two sections of the canal, of different diameters; one operation successful.—*Duration of Treatment,* 5 weeks; *Result,* cured.

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[illegible] *Admitted* [illegible] Age at marriage 32. No. of children 3.
History. [illegible] delivered by forceps of a sti [illegible] the urine began to escape; passed [illegible] a week after delivery; several months getting wel [illegible] four years.—*Extent of Lesion.* Th [illegible] of the bladder was [illegible] from the cervix to the urethra; behind th [illegible] the bone was denuded.—*Treatment.* First operation all was closed b [illegible] the angle behind the ramus; this was left; done on the knees and elbows; [illegible] sutures used [illegible] opening behind the ramus dissected off and closed with 7 sutur [illegible]

afterwards; 2 operations to close small openings made by traction; after the last operation there remained a pin-hole, which closed by contraction.—*Duration of Treatment*, 18 months; *Result*, cured.

78. *Admitted* Dec. 20, 1867. Age 29. Age at marriage 25. No. of children 1; of miscarriages 2.

History. Was in labor 180 hours: several days without pain after rupture of the membranes; delivered by hand; stillborn; could give no information regarding the bladder; urine began to escape two weeks after delivery; confined to bed two months; two miscarriages since. *Extent of Lesion*. There had been great loss of tissue, but by contraction the opening was reduced in size to admit the index finger, and was situated in the centre of the base of the bladder.—*Complications*. Cicatricial tissue.—*Treatment*. It was necessary to remove so much of the surrounding tissue with the edges of the fistula that the opening was a very large one; closed by 9 sutures.—*Duration of Treatment*, 4 weeks; *Result*, cured.

79. *Admitted* Jan. 7, 1868. Age 25. Age at marriage 19. No. of children 2.

History. In labor 78 hours: delivered by forceps; escape of urine two days after delivery.—*Extent of Lesion*. Loss of the base of the bladder, the cervix, and cul-de-sac; vagina shortened to one inch in depth; a fistula remained, extending from one ramus to the other, with its edges lying in contact; but little tissue covering the bones.—*Complications*. Uterus retroverted and bound down.—*Treatment*. An attempt to open the vagina was followed by an abscess; afterwards enough had been gained to close the fistula with 11 sutures; 4 operations afterwards to close an opening in the median line only large enough to admit a blunt hook; all cicatricial tissue, and opened after removal of the sutures.—*Duration of Treatment*, 12 months; *Result*, improved.—*Remarks*. Never returned; opening may have closed by contraction of cicatricial tissue.

80. *Admitted* Jan. 26, 1868. Age 29. Age at marriage 17. No. of children 2; of miscarriages 1.

History. In labor 78 hours: stillborn; the body remained undelivered 36 hours after passage of the head; physician then called in, who removed the body by traction; escape of urine from the birth; 5 months in bed; one child since at 7 months, which was removed by forceps.—*Extent of Lesion*. Great loss of tissue involving cervix and base of the bladder; slough of the perineum; tissues all lost behind the left ramus.—*Complications*. Cicatricial tissue filling the cul-de-sac.—*Treatment*. Required very extensive dissection and removal of cicatricial tissue; 2 operations necessary: one to close the fistula to the ramus; then a flap was taken from the lateral wall to cover the opening behind the bone.—*Duration of Treatment*, 6 weeks; *Result*, cured.—*Remarks*. Had 5 operations previous to admission.

81 (LXXV.). *Admitted* Jan. 30, 1868. Age 35. Age at marriage 33. No. of children 1.

History. In labor 123 hours: delivered with forceps; stillborn; two days after delivery lost control of the urine; for a month it was thought that she would die. —*Extent of Lesion*. Vagina shortened; cervix and posterior cul-de-sac lost; in the mass of cicatricial tissue the os could not be found, or any remains of the cervix except a hard mass, thought to be the posterior lip; it was only when on the knees and elbows that the fistula could be brought into view; by contraction, the fistula was drawn to one side and somewhat behind the uterus.—*Complications*. Uterus retroverted and fixed in the pelvis from a general cellulitis after labor.—*Treatment*. After some dissection in the cul-de-sac, the transverse fistula was closed by 8 sutures in the axis of the vagina; two weeks after, a small opening formed; while freeing the parts for the second operation, cut into the peritoneal cavity; no bad result, and was closed with the fistula by the same operation.—*Duration of Treatment*, 18 weeks; *Result*, cured.—*Remarks*. Peritoneal cavity opened by accident while freeing the edges of the fistula.

82. *Admitted* Feb. 10, 1868. Age 28. Age at marriage 24. No. of children 3.

History. In labor 55 hours: delivered by forceps; the bladder was emptied frequently; the urine began to escape a week after delivery.—*Extent of Lesion*. There was a laceration of the cervix through the vaginal wall to the neck of the bladder, which closed from above downward through the cervix; the whole neck n, using [illegible]

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cial edges of the fistula into healthy tissue, it was closed without difficulty by sutures, making a line of union an inch and a quarter in length; without any parent cause, an attack of peritonitis developed on the 4th day; this subsided, d union found perfect when the sutures were removed; on the 35th day sympns of pyæmia, and she died six weeks after the operation.—*Duration of Treatnt*, 6 weeks; *Result*, died.—*Remarks.* Had been operated on previous to mission.

. *Admitted* April 15, 1868. Age 33. Age at marriage 29. No. of children 2.
History. In labor 42 hours: forceps; loss of urine 20 days after delivery. jured five months.—*Extent of Lesion.* Loss of the upper half of the bladder; e vagina shortened by contraction, and the fistula hidden by the tissues in front the neck of the bladder; a fold was drawn back by cicatricial tissue in the cul-sac.—*Treatment.* Until the bands were divided the fistula seemed a small one; was then transverse and admitted two fingers; first operation very difficult; 11 itures; two small openings left; closed as one by 7 sutures.—*Duration of Treatent*, 10 weeks; *Result*, cured.

). *Admitted* May 4, 1858. Age 24. Age at marriage 24. No. of children 4.
History. In labor 34 hours: chloroform, forceps; bladder not emptied; lost e urine on the 5th day.—*Extent of Lesion.* Fistula in front and a little to the ft of the neck of the uterus, half an inch in diameter; there had been an adheon in the walls of the vagina, shutting up the neck of the uterus; mouth of the elvic abscess near the edge of this septum; the fistula was drawn behind the ght ramus.—*Complications.* As the result of an examination before admission, he had cellulitis and a pelvic abscess.—*Treatment.* Operation difficult, as the arts were unyielding from the old cellulitis; difficulty with the catheter; operaon only partially successful; second operation, with 11 sutures, successful.—*uration of Treatment*, 13 weeks; *Result*, cured.

1. *Admitted* June 1, 1868.
History. No record.—Fistula admitting two fingers, situated in front of the anteior lip, which sloughed; had been a laceration through the anterior lip and in he vaginal axis, but made transverse by cicatricial tissue on each side of the cerix.—*Treatment.* 2 operations: one for opening the cul-de-sac, and the other for losing the fistula.—*Duration of Treatment*, 11 weeks; *Result*, cured.

2. *Admitted* Oct. 5, 1868. Age 34. Age at marriage 23. No. of children 8.
History. In labor 60 hours: ergot, forceps; child large and stillborn; bladder mptied.—*Extent of Lesion.* Laceration of the cervix through the anterior lip and ase of the bladder; closed from above, leaving a sinus into the uterine canal bove the vaginal junction.—*Treatment.* With scissors produced the original conition; removed the tract of the sinus and closed the lips with 4 sutures, which rere removed on the 9th day.—*Duration of Treatment*, 6 weeks; *Result*, cured.

3. *Admitted* Oct. 9, 1868. Age 28. Age at marriage 20. No. of children 1.
History. In labor 48 hours: breech presentation; weighed 12 pounds; urine scaped from the time of delivery.—*Extent of Lesion.* Nothing left of the base of he bladder: tissue gone from behind the rami; inversion of the bladder through he fundus.—*Complications.* Loss of the entire urethra.—*Treatment.* 10 operations uring four years, during which time the fistula was bridged over to a small openng, and a new urethra was made.—*Result*, improved.

4. *Admitted* Oct. 17, 1868. Age 24. Age at marriage 18. No. of children 4.
History. In labor 30 hours: delivered by efforts of nature, stillborn; urine egan to escape on the 4th day. Injured four months.—*Extent of Lesion.* The istula extended from one ramus to the other and involved a loss of at least two-hirds of the base of the bladder: it was drawn into shape so that its corners rere square.—*Treatment.* Closed by 4 operations, the first one requiring 15 sutures. —*Duration of Treatment*, 5 months; *Result*, cured.

5. *Admitted* Oct. 19, 1868. Age 33. Age at marriage 20. No. of children 3.
History. In labor 30 hours: after the pains had ceased, the body was "delivred by hand," stillborn; the bladder was emptied; urine escaped shortly after

[illegible] At the depth of an [illegible] the posterior edge of [illegible] fistula was transverse [illegible] Atresia of the vagina.—[illegible] and a glass plug wor[illegible] 5 operations were [illegible] 4 months; *Result*, cured.

[illegible] Age 35. Age at marriage 2[illegible]. No. of children [illegible] forceps used; urine [illegible] before admission.—*Ex*[illegible] quarter of an inch of [illegible] at the first the finger [illegible] *Complications.* Atresia of the [illegible] plug worn for two months [illegible] only a small opening left [illegible] closing small opening.—[illegible] As the line contracted [illegible] when walking.

[illegible] Age at marriage 18. No. of children [illegible] by forceps; no information [illegible] passed from the time of [illegible] cul-de-sac, and neck [illegible] a transverse fistula at the neck [illegible] spine and deformed pelvis [illegible] of the narrowed pelvis [illegible] pregnancy; the fistula was [illegible] weeks; *Result*, cured.

[illegible] marriage 18. No. of children [illegible] forceps; stillborn. Large [illegible] admission.—*Extent of Lesion.* [illegible] just in front of the [illegible] the axis of the vagina [illegible] closed by 13 sutures [illegible] opening closed by [illegible] successful.—*Duration of Treatment*, [illegible]

[illegible] marriage 21. No. of children [illegible] convulsions; delivered with forceps [illegible] years before admission [illegible] the left side, which passed [illegible] of a deep sulcus passing [illegible] internal os into the bladder. [illegible] *Complications.* Puerperal mania.— [illegible] was developed [illegible] was worse at the time of her [illegible] *Treatment*, 4 months; *Result*, [illegible]

[illegible] marriage 25. No. of children 4. [illegible] efforts of nature; child in a state [illegible] delivery.—*Extent of Lesion.* A fistula existed [illegible] vagina; when this had been opened, the fistula was found [illegible] of the cervix, transverse to the axis of the vagina, and large enough to admit two fingers.—*Complications.* Partial atresia [illegible] vagina.—*Treatment.* Certain bands were divided to free the edges; these [illegible] secured by 14 sutures; the parts had united when the sutures were removed, [illegible] the day after jumped out of bed, and twice afterwards the parts separated, [illegible]ally closed.—*Duration of Treatment*, 12 months; *Result*, cured.

101. *Admitted* May 6, 1869. Age 36. Age at marriage 25. No. of children 5; of miscarriages 1.

History. Second labor lasted 48 hours: terminated by forceps; urine escaped 4 days after delivery; three children born since.—*Extent of Lesion.* Originally the laceration extended through the anterior lip to within an inch of the neck of the bladder, and then turned towards and as far as the left ramus.—*Treatment.* This case had been operated on before admission, and about half from each end had been closed; the remaining opening was closed by 6 sutures.—*Duration of Treatment,* 4 weeks; *Result,* cured.—*Remarks.* Had been operated on with benefit previous to admission.

102. *Admitted* May 7, 1869. Age 38. Age at marriage 20. No. of children 5.

History. In labor 17 hours: attempted to deliver with forceps, then version, and delivery finished by craniotomy, under ether; the head was very large; it was said that the head was impacted only one hour; the urine escaped one month after. Injured one year before admission.—*Extent of Lesion.* A laceration originally extended through the anterior lip of the cervix and along the median line into the base of the bladder; the tear through the cervix closed, leaving the opening in the base of the bladder.—*Treatment.* A V-shaped piece was removed from the cervix before the fistula could be closed; this was done by 7 sutures.—*Duration of Treatment,* 9 weeks; *Result,* cured.

103. *Admitted* Oct. 13, 1869. Age 24. Age at marriage 22. No. of children 1.

History. In labor 61 hours: delivered with forceps; child stillborn; three days after delivery the urine began to escape; confined to bed for three months.—*Extent of Lesion.* An opening high up behind the symphysis, and difficult to bring into view; the opening is but three-quarters of an inch in length, and in the midst of cicatricial tissue.—*Complications.* In the habit of taking large quantities of morphine; extensive laceration of the perineum.—*Treatment.* After the cicatricial tissue had been removed, the opening was two inches and a half in length.—*Duration of Treatment,* 12 weeks; *Result,* cured.

104. *Admitted* Oct. 14, 1869. Age 30. Age at marriage 19. No. of children 6; of miscarriages 2.

History. In labor 22 hours: delivered by forceps; urine escaped from time of delivery.—*Extent of Lesion.* Loss of the base and neck of the bladder, but the sides had become united so as to leave two openings: one just anterior to the cervix and the other directly behind the pubes, at which point the urethra is closed.—*Complications.* Fistula of the left ureter; recto-vaginal fistula; occlusion of the urethra.—*Treatment.* The openings into the bladder were closed by two separate operations without difficulty; some urine was lost when the small fistula in the ureter was found; several operations were performed to close this, but without success.—*Duration of Treatment,* 4 months; *Result,* cured.—*Remarks.* Both vesical and rectal fistulæ were closed; died afterwards of renal disease.

105. *Admitted* Oct. 19, 1868. Age 30. Age at marriage 20. No. of children 1.

History. In labor 48 hours: no interference; no control of urine after delivery.—*Extent of Lesion.* Base of the bladder and the urethra destroyed.—*Treatment.* 14 operations, six of which were for reconstruction of the urethra.—*Duration of Treatment,* 18 months; *Result,* not given.

106. *Admitted* Oct. 26, 1869. Age 28. No. of children 7; of miscarriages 1.

History. In labor 48 hours: craniotomy; six days after delivery urine began to escape.—*Extent of Lesion.* Base of the bladder and anterior lip of the uterus lost; the fistula is over two inches in length and extends from ramus to ramus; these bones were denuded of all tissue but the periosteum.—*Complications.* Prolapse of the posterior wall and fundus of the bladder.—*Treatment.* Required extensive dissection to bring the parts together without making traction on the short urethra; the line of union was three inches long and brought together by 18 sutures.—*Duration of Treatment,* 4 months; *Result,* cured.—*Remarks.* Required three months of preparatory treatment.

[illegible] No. of children [illegible] [illegible] sutures.—[illegible]

[illegible] No. of children 4 [illegible] began to escape [illegible] Fistula [illegible] months [illegible] previous [illegible]

[illegible] No. of children 1. *History.* [illegible] the perineum [illegible] stillborn [illegible] the other.—[illegible] Three months [illegible] after removal [illegible] sutures, closed [illegible].—*Result,* [illegible]

[illegible] No. of children 11. *History.* [illegible] delivered [illegible].—*Extent of Lesion.* [illegible] with great [illegible] there had been [illegible] which partly [illegible] treatment; after the [illegible] into the bladder [illegible] best to close the [illegible] weeks; *Result,* cured.

111. *Admitted* [illegible] 1870. Age [illegible]. Age at marriage 17. No. of children 1. *History.* [illegible] delivered with forceps [illegible] seven months.—*Extent of Lesion.* [illegible] neck of the bladder, was [illegible] narrowed the vagina; beyond the [illegible] destroyed.—[illegible] Atresia of the vagina, and urethra [illegible].—*Treatment.* [illegible] months to open the vagina, during which time [illegible] was used; bladder closed by 8 sutures; operation successful; after a [illegible] began to lose urine, due to a band pulling the urethra backward; by removing this band the retentive power was gained.—*Duration of Treatment,* 5 months; *Result,* cured.

112. *Admitted* April 20, 1870. Age 19. Age at marriage 17. No. of children 1. *History.* In labor 36 hours; delivered by forceps; escape of urine from time of delivery. Injured a year previous to admission.—*Extent of Lesion.* A fistula involving nearly the whole base of the bladder, and extended from one ramus to the other.—*Treatment.* 3 operations; first, 11 sutures used; closed all but at the neck of the bladder, where the catheter came in contact; next operation again failed, then cut a band which drew the neck of the bladder backward; after this the opening remained closed.—*Duration of Treatment,* 8 months; *Result,* cured.

113. *Admitted* June 14, 1870. Age 33. Age at marriage 15. No. of children 3.
History. Last labor, terminated by forceps; loss of urine since delivery; no further particulars given.—*Extent of Lesion.* A small opening at the neck of the bladder.—*Treatment.* 1 operation; 5 sutures.—*Duration of Treatment,* 8 months; *Result,* cured.

114. *Admitted* Sept. 22, 1870. Age 43. No. of children 1.
History. Labor difficult: time not given; delivered with forceps; escape of urine from delivery.—*Extent of Lesion.* A crescentic shaped fistula from the loss of the lower half of the base of the bladder; the corners were drawn up by bands on each side of the cervix.—*Treatment.* First operation, 13 sutures; small opening; this was closed by a second operation; again opened and finally closed by a third operation.—*Duration of Treatment,* 3 weeks; *Result,* cured.

115. *Admitted* Oct. 4, 1870. Age 35. Age at marriage 27. No. of children 1.
History. In labor 36 hours: forceps failed; craniotomy afterwards; escape of urine from delivery. Injured fourteen years.—*Extent of Lesion.* Loss of the upper third of the anterior wall of the vagina, the upper edge of which was formed by the cervix.—*Treatment.* A V-shaped piece was removed from the cervix, and the edges of the fistula brought together with 6 sutures; when these were removed, there was no union; a second operation, after some preparatory treatment, was successful.—*Duration of Treatment,* 22 weeks; *Result,* cured.—*Remarks.* Twice operated on previous to admission.

116. *Admitted* Oct. 4, 1870. Age 26. Age at marriage 24. No. of children 1.
History. In labor 4 days: delivered with forceps; stillborn; has had a loss of urine since her delivery. Injured five months.—*Extent of Lesion.* Loss of the middle third of the anterior wall; the fistula extended from one side of the vagina to the other, and of a crescentic shape from bands on each side of the cervix extending into the cul-de-sac.—*Treatment.* Three months preparatory treatment; the cicatricial bands were divided, the edges of the fistula denuded and brought together by 13 sutures; small opening in the midst of cicatricial tissue; second operation, no union; 6 operations more before it was closed.—*Duration of Treatment,* 19 months; *Result,* cured.—*Remarks.* Had phlebitis along the course of the femoral vessels on the right side, after the second operation.

117. *Admitted* Oct. 5, 1870. Age 45. Age at marriage 30. No. of children 5; of miscarriages 3.
History. No particulars given beyond the statement that the last labor was a very difficult one and occurred four years previous to admission.—*Extent of Lesion.* A fistula formed by the sloughing of the upper third of the anterior wall of the vagina, together with the neck of the uterus along the lower edge; more of the vaginal surface had sloughed than from the base of the bladder, so that the edge was slanting; on the upper side the tissue were gone as far as the cervix, and the remains of the cervix projected into the bladder.—*Complications.* Uterus retroverted.—*Treatment.* Cicatricial tissue covered a portion of the opening like a hood; from the position of the uterus, it was necessary to close the edges of the fistula over the cervix, leaving it in the bladder; this was done by 9 sutures.—*Duration of Treatment,* 9 weeks; *Result,* cured.—*Remarks.* Menstruated for the first time at 25 years of age.

118. *Admitted* Dec. 7, 1870. Age 43. Age at marriage 19. No. of children 11.
History. In last labor 36 hours: delivered by forceps; escape of the urine after delivery.—*Extent of Lesion.* Loss of the base of the bladder and cul-de-sac.—*Treatment.* 3 operations.—*Duration of Treatment,* 22 weeks; *Result,* cured.

119. *Admitted* Sept. 25, 1871. Age 33. Age at marriage 29. No. of children 3.
History. In labor 48 hours: breech presentation; delivered "by instruments," after version had been performed; the bladder was emptied during progress of labor, but not for several days after, when it began to escape by the vagina.—*Extent of Lesion.* The whole base of the bladder, including the neck and more than half the urethra, with loss of cul-de-sac; the inner face of the ramus on the left side was bared of all tissue; cicatricial bands on each side of the cervix, running into the cul-de-sac.—*Complications.* Had a rectal fistula which gradually

closed; urethra occluded.—*Treatment.* First operation after dividing the bands and opening the urethra; 10 sutures; two openings left; closed each by different operations, one of which had to be repeated.—*Duration of Treatment,* 9 months; *Result,* cured.—*Remarks.* Afterwards had a stone removed from the bladder.

120. *Admitted* Oct. 3, 1871. Age 33. Age at marriage 23. No. of children 1.
History. In labor 60 hours: stillborn; delivered by forceps; urine began to escape several days after delivery.—*Extent of Lesion.* Loss of the lower portion of the base of the bladder; after contraction, a transverse opening was left extending from ramus to ramus.—*Treatment.* There was so little tissue covering the left ramus that it was very difficult to denude the edges and to introduce the sutures; 13 sutures used; operation successful; afterwards a pin-hole opening was found against the left ramus; this closed by contraction.—*Duration of Treatment,* 9 months; *Result,* cured.

121. *Admitted* Oct. 6, 1871. Age 26. No. of children 1.
History. In labor 17 hours: delivered by forceps; bladder was not emptied; loss of urine since delivery; confined to bed 9 weeks.—*Extent of Lesion.* The entire base of the bladder lost, leaving the opening crescentic in shape, with the cornua backward; unable to find any vestige of the uterus left.—*Treatment.* The posterior wall of the vagina was united to the neck of the bladder; using 11 sutures; removed 12th day.—*Duration of Treatment,* 3 months; *Result,* cured.

122. *Admitted* Oct. 18, 1871. Age 34. Age at marriage 21. No. of children 8.
History. In the 7th labor was injured: lasted 17 hours, and terminated with forceps; bladder had to be emptied for two weeks, at the end of which time the urine was lost. Injured fifteen months.—*Extent of Lesion.* A small opening left in front of the cervix, the result of an anterior laceration.—*Complications.* Extensive laceration of the perineum.—*Treatment.* Fistula closed with 8 sutures.—*Duration of Treatment,* 4 weeks; *Result,* cured.

123. *Admitted* Oct. 21, 1871. Age 22. No. of children 1.
History. Labor 25 hours: delivered by craniotomy; loss of urine from time of delivery.—*Extent of Lesion.* Fistula in the median line near the cervix, large enough to admit the index finger.—*Treatment.* 2 operations: one to divide bands, and the other to close the fistula.—*Duration of Treatment,* 8 weeks; *Result,* cured.

124. *Admitted* Feb. 1, 1872. Age 28. Age at marriage 26. No. of children 1.
History. In labor 48 hours: delivered by forceps; bladder emptied only once during labor.—*Extent of Lesion.* Fistula an inch in diameter just in front of the cervix.—*Complications.* The whole vaginal surface covered by a phosphatic deposit.—*Treatment.* 1 operation, but it required months of preparatory treatment.—*Duration of Treatment,* 8 months; *Result,* cured.

125. *Admitted* Sept. 15, 1872. Age 28. Age at marriage 22. No. of children 1.
History. Not recorded.—*Extent of Lesion.* Fistula near the uterus, near the cervix, and half an inch in diameter.—*Treatment.* 1 operation; 6 sutures; removed the 10th day.—*Duration of Treatment,* 4 weeks; *Result,* cured.

126. *Admitted* Sept. 16, 1872.
History. Not recorded.—*Extent of Lesion.* Fistula to the left of the median line, extending to the side of the cervix, the result of a laceration.—*Treatment.* 2 operations.—*Duration of Treatment,* 7 months; *Result,* cured.

127 *Admitted* Sept. 21, 1872. Age 40. No. of children 1; of miscarriages 3.
History. Four days in labor: forceps: loss of urine from time of delivery. Injured three years; three miscarriages since.—*Extent of Lesion.* Cervix lacerated through the anterior lip into the bladder; the laceration remained unhealed.—*Treatment.* 1 operation; 8 sutures: 4 through the cervix and 4 through the fistula.—*Duration of Treatment,* 3 weeks; *Result,* cured.

128. *Admitted* Sept. 23, 1872.
History. Could get no information beyond the existence of the fistula for seven years.—*Extent of Lesion.* One fistula is immediately to the right of the median

line and half an inch from the cervix; another was found on the same side, near the ramus, as if the fistula had healed in the middle, leaving an opening at each end.—*Treatment.* One opening was closed with 6 sutures, and the other with 4. —*Duration of Treatment,* 3 months; *Result,* cured.

129. *Admitted* Sept. 23, 1872. Age 31. No. of children 1; of miscarriages 1.
History. In labor 3 days: was delivered with forceps; stillborn; 11 days after delivery involuntary escape of urine; miscarriage since birth of child.—*Extent of Lesion.* Laceration of the cervix, leaving an opening into the bladder close to the neck of the uterus.—*Treatment.* 1 operation; 6 sutures.—*Duration of Treatment,* 4 weeks; *Result,* cured.

130. *Admitted* Sept. 23, 1872. Age 26. No. of children 1.
History. In labor 24 hours: terminated by efforts of nature; stillborn; urine escaped at the end of a week.—*Extent of Lesion.* An opening existed at the neck of bladder which extended from bone to bone.—*Complications.* A recto-vaginal fistula.—*Treatment.* Before closing the fistula, the cicatricial bands in each angle were divided so as to free the corners from behind the rami; 6 sutures were used. —*Duration of Treatment,* 2 months; *Result,* cured.—*Remarks.* Rectal fistula closed afterward.

131. *Admitted* Sept. 24, 1872. No. of children 2.
History. Not recorded.—*Extent of Lesion.* A small opening, large enough to admit the uterine probe, found behind each ramus, without loss of tissue between. —*Complications.* An encysted stone in the bladder, which was not discovered until after closing the fistula.—*Treatment.* Each opening was closed by a separate operation; symptoms of cystitis gradually coming on after the operation, led to the discovery of the stone.—*Duration of Treatment,* 4 weeks; *Result,* cured.—*Remarks.* The stone was afterwards removed from the bladder.

132. *Admitted* Sept. 24, 1872. Age 30. Age at marriage 20. No. of children 1.
History. In labor 24 hours: no interference; no other particulars recorded.—*Extent of Lesion.* Loss of the whole anterior wall of the vagina.—*Treatment.* 1 operation.—*Duration of Treatment,* 4 months; *Result,* improved.—*Remarks.* Never returned; result unknown.

133. *Admitted* Nov. 21, 1872. Age 21. No. of children 1.
History. In labor 47 hours: delivered by craniotomy; the urine did not escape until the 13th day. Injured seventeen months.—*Extent of Lesion.* A fistula, directly in the base of the bladder, into which the finger could be introduced; dense cicatricial tissue on each side.—*Treatment.* The failure of previous operations was due to cicatricial traction; when the bands were divided the edges came together; 9 sutures used.—*Duration of Treatment,* 4 weeks; *Result,* cured.—*Remarks.* Had been operated on previous to admission.

134. *Admitted* Jan. 13, 1873. Age 28. No. of children 1.
History. In labor 36 hours: attempted to deliver with forceps, but failed; left to the efforts of nature; stillborn; the bladder had to be emptied by a catheter for three months after her confinement.—*Extent of Lesion.* Laceration entirely through the urethra, about one-third of an inch from the meatus; the desire was frequent to empty the bladder, and retention was difficult.—*Treatment.* By uniting the two sections of the urethra the constant drag on the neck of the bladder was relieved; the only difficulty of the operation was in adjusting accurately the two portions of the urethra.—*Duration of Treatment,* 4 weeks; *Result,* cured.

135. *Admitted* Feb. 5, 1873. Age 24. Age at marriage 21. No. of children 1.
History. In labor 48 hours: forceps; stillborn; large size; the bladder had been emptied by a catheter; two days after delivery the urine began to escape. Injured eight months.—*Extent of Lesion.* Fistula half an inch in diameter near the neck of the bladder, having cicatricial edges.—*Treatment.* Cause of failure due to the cicatricial edges; these were removed freely and brought together with 5 sutures.—*Duration of Treatment,* 4 weeks.—*Remarks.* Had been operated on previous to admission.

136. *Admitted* Sept. 11, 1873. Age 24. Age at marriage 22. No. of children 1.

History. In labor 5 days: forceps; stillborn; 14 pounds; bladder was emptied; two weeks after delivery the urine began to be lost. Injured about two years.—*Extent of Lesion.* The vagina and uterus destroyed, with the urethra and subpubic tissues; there remained nothing which could be utilized; the loss of tissue unequalled by any other case which had passed under my observation.—*Treatment.* After three months' preparatory treatment to heal the parts, the entrance to the vagina was closed, a small opening being left below; this gave support to the inverted bladder, and was followed by great relief; nothing else could be done.—*Duration of Treatment*, 6 months; *Result*, improved.

137. *Admitted* Oct. 16, 1873. Age 35. Age at marriage 29. No. of children 2.

History. In last labor 48 hours: no other particulars given.—*Extent of Lesion.* A fistula, half an inch in diameter, situated behind and close to the left ramus.—*Treatment.* Closed by two operations.—*Duration of Treatment*, 3 months; *Result*, cured.—*Remarks.* Operated on previous to admission.

138. *Admitted* March 5, 1874. Age 35. Age at marriage 30. No. of children 3; of miscarriages 1.

History. In second labor 26 hours: completed by efforts of nature, stillborn; the bladder was emptied; urine began to escape on the 10th day. Injured about two years; one child since.—*Extent of Lesion.* An opening found at the bottom of a pouch large enough to admit the index finger; the fundus of the bladder prolapsed through this opening; most of the posterior cul-de-sac was also lost with the uterus; the fistula was surrounded by a puckered mass of cicatricial tissue.—*Complications.* There had been great loss of tissue and destruction of the uterus.—*Treatment.* Closed at first with 10 sutures; a portion of the line separated afterwards; closed by another operation with 7 sutures: unsuccessful; third operation, 5 months afterwards, was successful.—*Duration of Treatment*, 6 months; *Result*, cured.

139. *Admitted* March 5, 1874. Age 25. Age at marriage 23. No. of children 1; of miscarriages 1.

History. In labor 26 hours: failed in applying the forceps; delivered by efforts of nature; child weighed 10½ pounds, head very large; urine retained 12 hours before delivery, and had to be drawn for 2 weeks after; urine began to escape at end of 3d week.—*Extent of Lesion.* Loss of the upper third of the anterior wall of the vagina, with the anterior lip of the uterus; the opening contracted so as to be reduced to a size only large enough to admit the finger, and was situated just in front of the cervix; prolapse of the bladder through the opening.—*Treatment.* The remains of the anterior lip formed the upper border of the fistula and made a larger arc than existed below; as a consequence, the angle of the denuded tissue on the vaginal surface had to be carried far out to avoid puckering; 10 sutures used.—*Duration of Treatment*, 5 weeks; *Result*, cured.

140. *Admitted* Sept. 15, 1874. Age 26. Age at marriage 19. No. of children 1.

History. In labor 60 hours: forceps attempted; delivery by craniotomy and blunt hook; child weighed 15 pounds; loss of urine from delivery; had puerperal fever afterwards, with phlegmasia dolens. Injured six years.—*Extent of Lesion.* Loss of the whole anterior wall of the vagina, with partial occlusion of the canal; a large portion of the cervix had also sloughed.—*Treatment.* Had 2 operations to open the vagina, and 3 for closing the fistula.—*Duration of Treatment*, 18 months; *Result*, cured.

141. *Admitted* Oct. 5, 1874. Age 29. Age at marriage 26. No. of children 1.

History. In labor 4 days: no control over the escape of urine after delivery; no further particulars given.—*Extent of Lesion.* Loss of the whole anterior wall of the vagina and part of the anterior lip of the cervix, with the cul-de-sac filled with cicatricial bands.—*Treatment.* The cul-de-sac was freely opened and the cervix divided laterally until it could be drawn down to neck of the bladder; it was then united in this position by 17 sutures; 2 operations afterwards to close small openings.—*Duration of Treatment*, 18 weeks; *Result*, cured.

142. *Admitted* Dec. 17, 1874. Age 35. No. of children 4.
History. In labor 32 hours: delivered by forceps.—*Extent of Lesion.* Anterior laceration of the cervix which had not closed, leaving a fistula in the median line extending half the distance to the neck of the bladder.—*Complications.* Cystitis when admitted.—*Treatment.* Required four months' preparatory treatment: one to free the cervix from cicatricial tissue, and one to close the fistula.—*Duration of Treatment*, 6 months; *Result*, cured.—*Remarks.* Had been operated on twice before admission.

143. *Admitted* Jan. 1, 1875. Age 25. No. of children 2.
History. In labor 98 hours: delivered by forceps; loss of urine since delivery; Injured two years before admission.—*Extent of Lesion.* Half an inch below the cervix was found an opening admitting the finger, the remains of extensive loss of tissue; the cervix and cul-de-sac were destroyed and bands ran in the opposite direction from the anterior edge of the fistula on to the posterior wall of the vagina.—*Treatment.* These bands acting in opposite directions had been the cause of failure; after they had been divided, the fistula was easily closed by 6 sutures. —*Duration of Treatment*, 4 weeks; *Result*, cured.—*Remarks.* Had been operated on three times before admission.

144. *Admitted* Jan. 28, 1875. Age 33. No. of children 2; of miscarriages 1.
History. In last labor 48 hours: breech presentation; no control over the escape of urine from time of delivery.—*Extent of Lesion.* Laceration of the cervix extending into the anterior wall of the vagina, which partially closed, leaving two openings, one at the neck of the bladder, and the other in the median line one inch below the cervix uteri.—*Complications.* Anterior portion of the urethra occluded. —*Treatment.* Each fistula closed by a separate operation.—*Duration of Treatment*, 12 weeks; *Result*, cured.

145. *Admitted* March 9, 1875. Age 30. Age at marriage 26. No. of children 3.
History. In labor 84 hours: twins; forceps; bladder not emptied. Was injured in her first labor.—*Treatment.* 1 operation.—*Duration of Treatment*, 3 weeks; *Result*, improved.—*Remarks.* Had been operated on twice previous to admission.

146. *Admitted* April 21, 1875. Age 25. Age at marriage 22. No. of children 1.
History. In labor 33 hours: no interference; bladder not emptied.—*Extent of Lesion.* A transverse fistula, close to the cervix uteri, about half an inch in length. —*Treatment.* 1 operation; 9 sutures; removed the 10th day.—*Duration of Treatment*, 4 weeks; *Result*, cured.—*Remarks.* Had been operated on three times previous to admission.

147. *Admitted* April 21, 1875. Age 25. Age at marriage 21. No. of children 1.
History. In last labor 15 hours: delivered with forceps.—*Extent of Lesion.* A fistula at the neck of the bladder nearly an inch in diameter, a result of a loss of one-third of the lower portion of the anterior wall.—*Treatment.* 1 operation; 11 sutures; removed on the 12th day.—*Duration of Treatment*, 3 weeks; *Result*, cured.

148. *Admitted* Sept. 18, 1875. Age 25. Age at marriage 20. No. of children 2.
History. First labor, lasting 8 days, terminated by forceps; stillborn; thinks the bladder was emptied; urine began to escape from delivery; in bed 2 months. Injured 4 years; second child born one year after.—*Extent of Lesion.* Fistula at the neck of the bladder, an inch long and half an inch wide, extending from the left of the median line to behind the right ramus; transverse bands from the edges of the fistula ran upon each side of the vagina, more on the left: these caused the anterior lip to somewhat overlap the fistula and to form a sulcus on each side of the opening.—*Complications.* Laceration of the cervix from before backward and on the left side; perineum was extensively lacerated.—*Treatment.* After division of the bands, the fistula became much larger; closed by 13 sutures; kept dry for several days after removing the sutures; second operation to close a new opening, using 6 sutures; again dry for several days, when an opening was found in the first line; this was closed with 7 sutures.—*Duration of Treatment*, 6 months; *Result*, cured.—*Remarks.* Had been operated on once previous to admission.

149. *Admitted* Sept. 18, 1875. Age 35. Age at marriage 32. No. of children 2.
History. In labor 48 hours: ergot, chloroform; forceps; stillborn; urine lost from the 2d day. Injured ten months.—*Extent of Lesion.* Laceration through the cervix from before backwards; that through the posterior lip extended into the cul-de-sac and healed, leaving a mass of cicatricial tissue; that through the anterior lip extended in the median line along the base to the neck of the bladder; the bands behind the uterus then drew the sides of the fistula backward so as to form a transverse opening just in front of the cervix; the tear through the anterior lip did not close.—*Treatment.* The bands were all divided so as to free the edges of the fistula, when it was closed in the median line and united with 3 sutures in the cervix and 7 in the fistula.—*Duration of Treatment*, 4 weeks; *Result*, cured.

150. *Admitted* Sept. 23, 1875. Age 44. Age at marriage 23. No. of children 10.
History. In labor 24 hours: ergot; stillborn; very large child; escape of urine from time of delivery. Injured ten months previous to admission.—*Extent of Lesion.* Loss of the whole base of the bladder, the neck of the bladder, and one-third of the urethra; the vagina terminated along the posterior edge of the fistula; it was found that the posterior wall of the vagina had united to the edge of the fistula, thus shutting up the cervix and vagina beyond.—*Complications.* Prolapse of the whole bladder through the fistula; the perineum had been extensively torn.—*Treatment.* Through a small opening a probe passed, demonstrating the septum; when this had been divided, the edges of the fistula could be brought together, which was done with 15 sutures; small opening left; closed by 6 sutures; opening again made by the patient in attempting to introduce the catheter herself; closed by 6 sutures.—*Duration of Treatment*, 5 months; *Result*, cured.

151. *Admitted* Nov. 9, 1875. Age 39. No. of children 4; of miscarriages 5.
History. Time not given; had no labor-pains after rupture of the membranes; ergot; forceps; stillborn; loss of urine from the time of delivery. Injured five years; not pregnant since.—*Extent of Lesion.* Loss of the base of the bladder, including the neck of the bladder and upper part of the urethra; the opening was an inch wide and extended from ramus to ramus; mouth of the right ureter exposed; uterus retroverted, with the cervix projecting into the bladder; the posterior wall of the bladder had become adherent over the posterior lip of the uterus up to the os.—*Complications.* Prolapse of the fundus of the bladder through the fistula.—*Treatment.* An attempt had been made to close the fistula and restore the neck of the bladder, and this had led to an adhesion of the fundus of the bladder to the cervix; this could not now be dissected off, and nothing could be done but close the remaining opening; this was done with 14 sutures.—*Duration of Treatment*, 4 weeks; *Result*, cured.—*Remarks.* Had been operated on four times previous to admission.

152. *Admitted* Dec. 9, 1875. Age 32. Age at marriage 20. No. of children 8.
History. In labor 37 hours: embryotomy; bladder not emptied; loss of urine from the time of delivery; confined to bed five months.—*Complications.* Partial atresia of the vagina at the depth of an inch, through which can be seen the prolapsed fundus of the bladder.—*Treatment.* 2 operations.

153. *Admitted* Jan. 3, 1876. Age 25. No. of children 1.
History. In labor 44 hours: forceps; urine began to escape 3 weeks after delivery.—*Extent of Lesion.* A fistula but a quarter of an inch in diameter, situated in the median line and in front of the neck of the bladder; there had been great loss of tissue, and the opening was surrounded by cicatricial tissue.—*Treatment.* 1 operation; the cicatricial edges were freely removed, and the surfaces united by 7 sutures.—*Duration of Treatment*, 25 days; *Result*, cured.

154. *Admitted* Feb. 4, 1876. Age 46. Age at marriage 22. No. of children 3; of miscarriages 2.
Extent of Lesion. Fistula quite small, situated in the median line at the junction of the base and neck of the bladder.—*Treatment.* 3 operations.—*Duration of Treatment*, 3 months; *Result*, cured.

155. *Admitted* May 19, 1876. Age 35. Age at marriage 27. No. of children 1.
History. In labor 12 hours: delivered with forceps.—*Extent of Lesion.* Loss of the base of the bladder and a portion of the urethra.

156. *Admitted* Oct. 9, 1876. Age 26. Age at marriage 22. No. of children 2.
History. In last labor 48 hours: delivered by forceps. Injured three months previous to admission.—*Extent of Lesion.* Fistula in the neck of the bladder.—*Complications.* Extensive laceration of the perineum.—*Treatment.* 1 operation; 18 sutures; removed 11th day.—*Duration of Treatment*, 14 weeks; *Result*, cured.—*Remarks.* Had been operated on previous to admission.

157. *Admitted* Oct. 17, 1876. Age 36. Age at marriage 17. No. of children 7.
History. In last labor 33 hours: delivered by the efforts of nature; loss of urine since delivery. Injured four years previous to admission.—*Extent of Lesion.* Laceration of the anterior lip of the uterus through the median line, which closed leaving a fistula into the bladder just in front of the cervix.—*Treatment.* 1 operation.—*Duration of Treatment*, 8 weeks; *Result*, cured.

158. *Admitted* Oct. 28, 1876. Age 24. Age at marriage 20. No. of children 1.
History. In labor 20 hours: head impacted 13 hours; embryotomy; bladder not emptied during labor. Injured three years.—*Extent of Lesion.* A fistula quarter of an inch in diameter close behind the left ramus.—*Complications.* Laceration of the perineum.

159. *Admitted* Oct. 2, 1877. Age 47. Age at marriage 32. No. of children 3; of miscarriages 2.
History. With the first child.—*Extent of Lesion.* Fistula quite small, at the neck of the bladder.—*Treatment.* 2 operations.—*Duration of Treatment*, 7 weeks; *Result*, cured.—*Remarks.* Had been operated on several times previous to admission, but the fistula opened by traction.

160. *Admitted* Nov. 19, 1877. Age 30. Age at marriage 28. No. of children 1.
History. In labor 24 hours: delivered with forceps. Injured eight months previous to admission.—*Extent of Lesion.* An opening midway between the neck of the bladder and cervix uteri, an inch in diameter, with a prolapse of the bladder through it.—*Treatment.* 1 operation; 11 sutures; removed on the 11th day.—*Duration of Treatment*, 4 weeks; *Result*, cured.

161. *Admitted* Dec. 17, 1877. Age 27. No. of children 2.
History. In last labor 48 hours: delivered with forceps; loss of urine from the second day after delivery.—*Extent of Lesion.* The cervix had been turned into the bladder, leaving a small and tortuous opening in the midst of cicatricial tissue.—*Remarks.* Had been operated on previous to admission.

RECTO-VAGINAL FISTULA.

162 (LXIX.). *Admitted* Nov. 13, 1862. Age 33. Age at marriage 27. No. of children 1.
History. In labor 140 hours: delivered by forceps; stillborn; no stool was thrown off; feces passed from the vagina three days after delivery.—*Extent of Lesion.* An opening into the rectum was to the left of the median line, half an inch beyond the fourchette, in the shape of a half circle, and scarcely large enough to admit the end of the index finger.—*Treatment.* In consequence of its shape and position, it was closed by dissecting off a flap from the lateral wall, which was folded down over the fistula, so that when secured the vaginal tissue had been turned into the rectum; 9 sutures were used.—*Duration of Treatment*, 4 weeks; *Result*, cured.

163 (LXVI.). *Admitted* Jan. 3, 1864. Age 39. Age at marriage 14. No. of children 8.
History. Eighth pregnancy: 84 hours in labor; delivered by forceps; ergot had been administered without effect, for the head was on the perineum 36 hours;

169. *Admitted* Nov. 17, 1866. Age 24. Age at marriage 22. No. of children 1.
History. In labor 4 days: delivered with forceps.—*Extent of Lesion.* The original condition was an extensive laceration through the sphincter ani and recto-vaginal septum; this closed below, leaving a fistula above between the rectum and vagina.—*Complications.* A vesico-vaginal fistula. See Case 56.—*Treatment.* The united portion was divided with a pair of scissors, and the whole brought together as if for laceration of the perineum.—*Duration of Treatment*, 3 weeks; *Result*, cured.

170. *Admitted* Oct. 19, 1869. Age 27. Age at marriage 26. No. of children 1.
History. Labor lasted 5 hours, and was natural in every respect: on the day after delivery noticed the escape of flatus by the vagina.—*Extent of Lesion.* The fistula extended obliquely from the sphincter muscle to the left, and was an inch in length.—*Treatment.* Closed by one operation.—*Duration of Treatment*, 3 months; *Result*, cured.

171. *Admitted* Jan. 9, 1873. Age 26. No. of children 1.
History. In labor 24 hours: terminated by efforts of nature; child stillborn.—*Extent of Lesion.* Fistula just beyond the sphincter ani.—*Complications.* A vesico-vaginal fistula. See Case 130.—*Treatment.* 1 operation; 5 sutures; removed on the 8th day.—*Duration of Treatment*, 3 weeks: *Result*, cured.

VESICO-VAGINAL FISTULA.

II.—From other causes than Childbirth.

172 (LXX.). *Admitted* Nov. 1864. Age 36. Social relation, married. Age at marriage 18. No. of children 10.
History. In Nov. 1862, was delivered, after a labor of three days; shortly after, an abscess burst into the vagina, followed by an involuntary escape of the urine; nine months previous to admission, she had been delivered of her tenth child.—*Local Condition.* Abscess opening into the bladder; from an opening into the vagina, situated about half an inch behind the neck of the bladder, the urine all escaped; a sound was passed along the sinus until it reached the side of the uterus, when its point passed into the bladder.—*Treatment.* The point of a pair of scissors, following a probe, was introduced into the sinus and its course divided up for some two inches until the opening into the bladder had been reached; the edges of the opening into the bladder were then freshened, the tract of the sinus removed in one strip by scissors, and the whole line closed by 11 interrupted sutures.—*Duration of Treatment*, 4 weeks; *Result*, cured.

173 (LXXI.). *Admitted* May 19, 1866. Age 47. Social relation, single.
History. Two years before began to have incontinence of urine; her physician removed a corroded "horseshoe" pessary, one limb of which had entered the bladder; she had not been examined for five years, and did not know of its existence in the vagina.—*Local Condition.* Opening into the bladder was situated behind the left ramus, at the bottom of the sulcus formed between the lateral wall and the base of the bladder; a No. 12 bougie could be passed through the opening, the edges of which were thin and tense, being formed entirely of cicatricial tissue.—*Treatment.* She had been operated on by her physician, and the failure was due to the character of tissue; it was closed with 9 sutures by doubling down a fold of the lateral wall over on to the base of the bladder, so as to inclose the fistula in a pouch below.—*Duration of Treatment*, 4 weeks; *Result*, cured.—*Remarks.* Had been operated on previous to admission.

174 (LXXII.). *Admitted* Dec. 8, 1866. Age 25. Social relation, single.
History. Some 20 months previous to admission she was accidentally wounded by a ball from a revolver.—*Local Condition.* It was found that the ball had entered the right thigh and passed from the vagina through the bladder into the abdominal cavity and lodged above the crest of the ilium.—*Treatment.* No union after the first and second operations, on account of cicatricial tissue and the occurrence of cystitis; finally, this tissue was freely removed, and the third operation was suc-

[illegible] months; *Result*, cured.—[illegible]

[illegible]

[illegible] Age 34. Social relation, married. Age at [illegible]

[illegible] break in the vagina about [illegible] which was increased [illegible]—*Local Condition*. An [illegible] of the bladder in the [illegible] syphilis were detected.—*Treatment*. [illegible] was closed with 10 sutures, [illegible] tissue; the sutures were [illegible] taken place.—*Result*, not improved.—*Remarks*. [illegible] interfered with the process of healing.

[illegible] Age 34. Social relation, married. Age at [illegible]

[illegible] syphilitic sloughing.—*Local Condition*. [illegible] syphilitic condylomata.—*Treatment*. [illegible] treatment, and then the fistula [illegible] the 8th day.—*Duration of Treatment*, [illegible] case in which union was obtained where [illegible]

[illegible] Age 19. Social relation, married. Age at marriage [illegible]

[illegible] had been attempted for the relief of [illegible] opening found across the neck of the bladder.—[illegible] open the vaginal outlet, and the other [illegible] weeks; *Result*, cured.—*Remarks*. Delivered [illegible] Feb. 1869.

[illegible] 1870. Age 22. Social relation, single.

[illegible] absence of the vagina; an attempt had been made to reach [illegible] The urethra in front of the neck of the bladder [illegible] neck divided, so that the finger entered directly into the [illegible] An artificial vagina was made and the fistula closed [illegible]—*Result*, cured.—*Remarks*. See history of this case [illegible] Congenital Absence of the Vagina.

[illegible] 1871. Age 62. Social relation, married. Age at marriage [illegible]

[illegible] child was 20 years of age; change of life at 47. had been [illegible] previous to admission; without any known cause, she [illegible] irritation of the bladder; in the preceding January the [illegible] but without relief.—*Local Condition*. An attempt had [illegible] the bladder; a portion of the urethra and the neck of the [illegible] open; the consequence was that the superabundant tissue [illegible] bladder crowded into the opening as a plug and caused great [illegible] no cystitis.—*Treatment*. The tissue projecting through the [illegible] removed by a double ligature; after its removal she was [illegible] for six months, during which time the urine had a free [illegible] was then closed with 6 sutures; successful; it was supposed [illegible] had existed at the neck of the bladder, causing the irritation. [illegible] *Treatment*, 2 months; *Result*, cured.

[illegible] Sept. 18, 1877. Age 24. Social relation, married. Age at marriage [illegible]

[illegible] Fistula accidentally made during the operation for atresia vaginæ [illegible] childbirth.—*Local Condition*. The vagina was constricted from a [illegible] depth of an inch; just above this point the false opening extended [illegible] entered the bladder.—*Treatment*. Closed by 1 operation, and [illegible] removed on the 9th day.—*Duration of Treatment*, 3 weeks; *Result*,

181. *Admitted* Sept. 27, 1877. Age 40. Social relation, single.
History. Without known cause, began to suffer from cystitis six years previous to admission; two years after had an opening made in the base of the bladder, with entire relief; but the opening was closed too soon, and the disease returned; an attempt was made to dilate the urethra, which resulted in laceration, with no retentive power afterwards.—*Local Condition.* The urethra was lacerated backward from the outlet for half an inch; with an irritable and contracted bladder; from the thickening and contracting of the base of the bladder, the urethra was drawn backward and was in the same condition as if an opening had been made through the base of the bladder.—*Treatment.* Examination gave evidence of an irritable bladder, but none of kidney disease; an opening was made in the bladder and the urethra lengthened out half an inch; second day after operation, irritation of the bladder came on with microscopic evidence of kidney disease; on the sixth day died from uræmic poisoning.—*Duration of Treatment*, 6 weeks; *Result*, died.—*Remarks.* Uræmic poisoning was hastened by the use of ether; with the existing disease the organs were placed above the secreting point in its elimination.

III.—For the Removal of Stone.

182 (I.). *Admitted* April, 1866. Age 46. Social relation, married. Age at marriage 18. No. of children 15.
History. Eighteen months after closing a vesico-vaginal fistula, resulting from an antero-posterior laceration of the cervix, a stone was removed from the bladder.—*Local Condition.* Large stone in the bladder.—*Treatment.* The stone was removed through an opening made in the base of the bladder; in consequence of the previous loss of urine and size of the stone, it was first crushed through this opening, the large pieces removed with a scoop, and the bladder washed out; three months afterwards, the opening was closed with 8 sutures.—*Duration of Treatment*, 4 months; *Result*, cured.

183. *Admitted* May 13, 1870. Age 40. Social relation, married.
History. Operated on by Dr. Sims in 1860, by which the neck of the uterus was turned into the bladder; remained well for eight years afterwards, when symptoms of cystitis occurred, and her condition was a miserable one at the time of admission.—*Local Condition.* By means of the endoscope, it was found that the mucous membrane of the bladder was extensively ulcerated; until an anæsthetic was given, it was not known that an encysted stone existed on the left side of the bladder.—*Treatment.* The stone was removed through an opening made in the base of the bladder, and for five months the bladder was kept empty and frequently washed out; the fistula was then closed with 6 sutures.—*Duration of Treatment*, 3 months; *Result*, cured.—*Remarks.* 2 years after the operation there had been no return of the cystitis.

184. *Admitted* Sept. 24, 1872. Social relation, married. No. of children 2.
History. Had had a small fistula behind each ramus closed by different operations.—*Local Condition.* After the last opening had been closed, irritation of the bladder came on, which was thought due to the use of the catheter; after a careful examination, an encysted stone was found.—*Treatment.* Removed through an artificial fistula, and the bladder left empty for three months, when the opening was closed; in the interval she had returned home.—*Duration of Treatment*, 2 months; *Result*, cured.—*Remarks.* An ordinary toilet pin was found to have been the nucleus.

185. *Admitted* Sept. 18, 1873. Age 39. Social relation, married. No. of children 6.
History. A stone had been removed from the bladder nine months before admission.—*Local Condition.* Either as a result of the last labor or from a slough following the removal of the stone, atresia of the vagina existed; the opening was small and involved the neck of the bladder, as well as a portion of the urethra, with a prolapse of the mucous membrane of the bladder.—*Treatment.* 5 operations, extending over a period of two years, for opening the vagina and closing the fistula; when last seen, it was supposed that the partial loss of urine was due to

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[illegible] on the urethra, as no opening [illegible] continued.—*Result*, improved.— [illegible] hospital and nothing was known of her [illegible]

[illegible] 1874. Social relation, married.

[illegible] of a vesico-vaginal fistula, the patient [illegible] which increased to such a degree as to [illegible] —*Local Condition.* No examination [illegible] administered; the sound detected a hard [illegible] bladder, which was situated in the median [illegible] With a sound in the bladder as a guide, by [illegible] upon; it was found that a suture had been [illegible] the tissues; the loop had gradually worked [illegible] projected into the bladder; on these points [illegible] place.—*Result*, cured.

March 7, 1876. Age 42. Social relation, married. N

In January, 1869, she had a vesico-vaginal fistula [illegible] ulceration of the cervix through the anterior lip; [illegible] January, 1873, since which time several attempts had [illegible] and without success.—*Local Condition.* A vesico-vaginal [illegible] the removal of stone from the bladder; the edges were [illegible] freshening of the surfaces for operation.—*Treatment.* [illegible] first not being entirely successful.—*Duration of T*[illegible] cured.—*Remarks.* Had been operated on several times [illegible]

[illegible] 19, 1867. Age 43. Social relation, married.

A stone had been removed from the bladder about four years [illegible] several attempts had been made to close the opening.—*L*[illegible] opening in the base of the bladder remaining after the removal [illegible] Closed by one operation.—*Duration of Treatment*, 3 weeks.—*Remarks.* Had been operated on previous to admission.

IV.—For the Relief of Cystitis.

[illegible] Nov. 8, 1867. Age 35. Social relation, married. Age at marriage [illegible] of children 1.

Three years before admission she had a fall; disease of the bladder [illegible] —*Local Condition.* Uterus retroverted; she had had cellulitis; [illegible] bladder were thickened, with all the symptoms of cellulitis.—*Treatment.* [illegible] months' local treatment, and with but little benefit, an artificial opening [illegible] made between the vagina and bladder; it was left open for 18 months. [illegible] took place in consequence of its cicatricial edges; 5 months after [illegible] was again closed with 7 sutures.—*Duration of Treatment*, 32 months; cured.

[illegible] June 10, 1868. Age 27. Social relation, single.

Two years before admission patient had received a blow against the [illegible] which was followed by irritation of the bladder; she then took cold [illegible] resulted in cystitis.—*Local Condition.* When the bladder was opened it [illegible] lined with a mass of granulations, which bled readily.—*Treatment.* [illegible] 10th day after opening the bladder, cellulitis and local peritonitis came on [illegible] was sick for 3 months; after a year, finding no disease with the [illegible] the fistula was closed, 8 sutures being used; after the bladder had gradually dilated, there was no further difficulty.—*Duration of Treatment*, 24 months; cured.

191 (LXXIV.). *Admitted* June 22, 1868. Age 39. Social relation, married. Age at marriage 21. Sterile.

History. At 17 arrested the menstrual flow by putting her feet in cold water; this led to irritation of the bladder; shortly after marriage took cold; was confined to bed for several months afterwards, and had never after been free from irritation of the bladder; had an abscess which emptied into the bladder; fifteen months previous to admission, sudden incontinence of urine came on.—*Local Condition.* After an attack of cellulitis, an abscess formed and refilled a number of times; while under ether the remains could be felt on the left side, extending between the uterus and the bladder under the broad ligament towards the ovary; the bladder was contracted and the uterus immovable; the opening into the bladder entered the vagina just in front of the uterus.—*Treatment.* As it was found that the bladder was not emptied by this sinus, the condition explained the fact that she had not been entirely relieved after the urine began to escape; it was thought best to enlarge this opening; death from uræmia took place 55 hours after the operation.—*Duration of Treatment,* 55 hours; *Result,* died.—*Remarks.* The immediate cause of death was the use of ether, with advanced disease of the kidney.

192. *Admitted* Oct. 13, 1868. Age 33. Social relation, married. No. of children 1.

History. After her labor, which lasted 75 hours, there remained incontinence of urine; this difficulty had existed two years.—*Local Condition.* The urethra was found patulous enough to admit the end of the index finger, as if it had been lacerated by dilatation; there had been laceration of the perineum, and a cystocele existed.—*Treatment.* As it was thought the loss of urine might be due to dragging on the urethra, the operation for cystocele was done and then the perineum closed, but without benefit; the irritated bladder was then examined by the endoscope, and found extensively ulcerated about its neck; this condition, for a time, received local treatment, which seemed to act as a source of irritation; after two years' treatment by various means, it was at length decided to open the base of the bladder; at the end of two weeks it had healed, and she was discharged, greatly relieved: to wash out the bladder daily and return at the end of six months.—*Result,* improved.—*Remarks.* This woman entirely neglected herself on leaving the Hospital, allowed the opening to close, and finally died of Bright's disease.

193. *Admitted* Oct. 5, 1869. Age 19. Social relation, single.

History. After exposure to cold a year previous to admission, began to suffer from irritation of the bladder.—*Local Condition.* Cystitis; vaginitis; general health much impaired.—*Treatment.* After local treatment for a month by means of the endoscope and with no benefit, the bladder was opened, with entire relief.

194. *Admitted* March 31, 1871. Age 27. Social relation, married. No. of children 1.

History. Two years previous to admission had a large vesico-vaginal fistula closed; a few weeks after her discharge she began to suffer from irritation of the bladder; she became pregnant and was delivered at the end of a year; the difficulty with the bladder increased, and she returned to the Hospital two years after closure of the fistula.—*Local Condition.* Cystitis, with the bladder much contracted and its coats thickened.—*Treatment.* As the vagina was much shortened, from the great loss of tissue necessitating the bringing together of the cervix and neck of the bladder, a transverse opening had to be made along the old line of union; the loss of blood was great; the bladder was washed out several times a day for nine months, when the opening was closed with 8 sutures.—*Duration of Treatment,* 12 months; *Result,* cured.

195. *Admitted* Oct. 2, 1871. Age 35. Social relation, married. Age at marriage 16. Sterile.

History. Began to suffer with irritation of the bladder from the time of marriage, which was due to sexual intercourse.—*Local Condition.* A short vagina was the beginning of her trouble after marriage, and this source of irritation led to cystitis.—*Treatment.* Shortly after admission the bladder was opened, with great relief at first; two weeks after had an attack of cellulitis, from which she did not recover for two months, but was then in good condition.

196. *Admitted* Feb. 9, 1872. Age 22. Social relation, single.
History. For six years had suffered from irritation of the bladder, from no known cause.—*Local Condition.* No pus found in the urine; the endoscope showed the existence of an erosion at the neck of the bladder.—*Treatment.* An opening made in the base of the bladder, which closed after a month; opened again, but at the end of six months had not materially improved; the urethra was then laid open from a quarter of an inch of the meatus to the neck of the bladder, without cutting through at this point; the diseased surface was thus exposed, and healed after application of the nitrate of silver and keeping the parts clean; the opening in the urethra was afterwards closed at one operation. —*Duration of Treatment,* 18 months; *Result,* cured.—*Remarks.* Aftewards married, had a child, and remained in good health.

197. *Admitted* Oct. 6, 1873. Age 23. Social relation, single.
History. Suffered a year from irritation of the bladder resulting from exposure to cold.—*Local Condition.* After opening the bladder, a fissure was found in one of the folds at the neck; no disease of the bladder.—*Treatment.* Through the opening in the base of the bladder the fissure was brought into view; this was snipped with a pair of scissors; the surface rapidly healed, but made no advance by local treatment; fistula was closed with 10 sutures.—*Duration of Treatment,* 6 weeks; *Result,* cured.

198. *Admitted* Dec. 12, 1873. Age 45. Social relation, single.
History. Obliged to empty the bladder every ten minutes during the past year, or the urine would escape and continue to flow until the bladder had been evacuated fully.—*Local Condition.* The urine was found loaded with pus; granulations could be felt with a sound at the fundus and other portions of the bladder.—*Treatment.* After washing out the bladder for a month, without any benefit, an opening was made in the base of the bladder; through the opening applications were made to the granulations, and the bladder was washed out frequently.

199. *Admitted* April 28, 1874. Age 30. Social relation, married.
History. From childhood had suffered from irritation of the bladder.—*Local Condition.* Found the uterus retroverted, which was originally the cause of the cystitis; the urine contained pus, but no casts.—*Treatment.* The uterus was replaced, and then the opening was made into the bladder; an artery was divided at the upper angle which required a stitch, twisted as a suture, to arrest it; improved rapidly after the operation.

200. *Admitted* June 15, 1874. Age 31. Social relation, single.
History. Had been operated on for the relief of cystitis twenty months previous to admission.—*Local Condition.* A fistula was found, an inch and a half long in the bladder, while the urethra had been laid open for two-thirds of its length. —*Treatment.* The edges were denuded, as in an ordinary fistula, and brought together by 12 sutures; the opening in the urethra was closed at the same time. —*Duration of Treatment,* 3 weeks; *Result,* cured.

201. *Admitted* March 21, 1875. Age 32. Social relation, married. Age at marriage 24. Sterile.
History. The bladder had been opened three years before for the relief of cystitis; three attempts had been made to close it without success.—*Local Condition.* Two small openings remained, the original one having been united in the central portion.—*Treatment.* The septum between the openings was divided, the edges freshened, and brought together with 7 sutures.—*Duration of Treatment,* 3 weeks; *Result,* cured.—*Remarks.* Had been operated on three times in the attempt to close the fistula.

202. *Admitted* Dec. 12, 1875. Age 17. Social relation, single.
History. Two years before, the bladder had been opened for the relief of cystitis.—*Local Condition.* Fistula in the median line large enough to admit the index finger.—*Treatment.* Closed by one operation, using 6 sutures.—*Duration of Treatment,* 6 weeks; *Result,* cured.

CHAPTER XXXIV.

DISEASES OF THE URETHRA.

I ENTER upon a consideration of these diseases with mistrust, for our knowledge of them is yet very limited, on account of the great difficulty met with in making proper inspections. What knowledge we do possess is based on pathological views as little trustworthy as those which were held in reference to uterine diseases a generation ago. It is to be hoped that the time is not far distant when the ingenuity of some one will furnish us with effective means of inspecting the urethra, and thus throw as much light upon the nature and treatment of its diseases, as was done for the uterus when Sims's speculum was introduced. This is the more to be desired because it is as rare to find the mucous membrane of the urethra in a perfectly healthy condition, as it is that of the throat. At least this is true of those women who have passed under my observation, suffering from some form of uterine disease. The cause of this is yet to be determined. It may be but an indication of a general diseased condition of the mucous membranes throughout the body, the result of impaired nutrition; or it may be that the condition of the urethral mucous membrane is only an effect of the obstructed circulation in the pelvis, a result also of impaired nutrition similar to what obtains in the uterus.

For examining the urethra, Dr. A. Reeves Jackson, of Chicago, Ill., recommends a tapering glass tube,[1] closed at one end, and provided with a flange at the other. It has a fenestra on one side, and resembles in shape the well-known rectal speculum, though much smaller. This instrument is two and a half inches long, and half an inch in outside diameter, but several sizes would be found useful. It is claimed that a very thorough inspection of the urethra may be made with this speculum. It greatly facilitates making applications at special points, and is useful for the removal of certain growths; but the field of inspection it offers is very limited.

Dr. Skene, of Brooklyn, has employed a somewhat similarly shaped instrument, which he has perfected as a urethral endoscope, describing it as follows:[2] "The instrument consists, 1st, of a glass tube, precisely

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[1] Gynæcological Transactions, vol. ii. 1877.

[2] Am. Journ. of Obstetrics, etc., Oct. 1878, p. 768.

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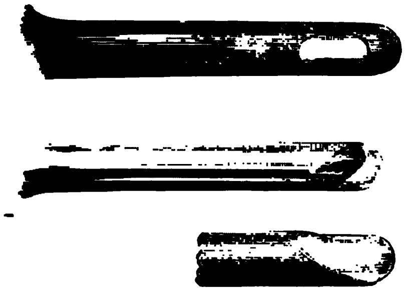

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endoscope offers the best means for exploration in this neighborhood, and yet, on account of its limited range, it is far from satisfactory.

In fact with our means for exploration at the present time, I cannot suggest a better procedure than to open the urethra over the point we wish to bring into view. Of course this must not be done carelessly or by an incompetent person. The opening should always be made in the median line, but never extended through the meatus or through the neck of the bladder. It will always prove comparatively an easy matter to close such an opening.

In a general manner the disease of the urethra may be classified under the following heads:—

1. Inflammation of the mucous membrane, or urethritis.
2. Pedunculated, vascular, and neuromatoid growths.
3. Prolapse of the mucous and submucous tissues.
4. Fissures at the neck of the bladder.
5. Urethrocele.
6. Laceration of the urethra from dilatation.

General inflammation of the mucous membrane, or *urethritis*, may be caused by an extension of gonorrhœal inflammation from the vagina into the urethra, from exposure to cold, or it may result from direct violence. Whenever the lining membrane of the urethra becomes inflamed from any cause, the process must be arrested as soon as possible, or the inflammation may extend to the bladder and lead to more serious difficulties. The patient must be kept in the recumbent position, the bowels acted on by saline purgatives, and the urine made bland by diluent drinks. Hot-water vaginal injections and warm sitz-baths are essential. When it is possible to do so, the urethral tract should be washed out several times a day with warm water. By placing the patient on a bed-pan, a large portion of the urethra can be washed out by simply throwing the water against the outlet, much of which will enter and again escape. If the inflammation is not too great, a pair of long dressing forceps can be introduced, and by separating the blades the canal will be opened quite widely. It is not advisable that the injection should pass into the bladder, since it would be the means of spreading the disease. But if it be evident that the bladder has become involved, it will be necessary to wash out its cavity also. A cone-shaped urethral speculum should be used, made of six wire bars placed at equal distances, and opening out gradually, so that the neck of the bladder can be sufficiently dilated. Through this the warm water may be injected, or a small rubber tube can be attached to the small nozzle of a Davidson's syringe and passed into the bladder, enough room being thus left for the escape of the water into the bed-pan. The speculum should be very carefully introduced, the canal should only be dilated sufficiently for the purpose, and the danger of causing laceration at the neck of bladder should always be borne in mind. After washing out the urethra, the extract of pinus Canadensis, to which a little impure carbolic acid has been added, should be thoroughly applied. Sometimes an application of a weak solution of nitrate of silver or of impure carbolic acid alone will be found useful. Then, as the case improves, vaseline or a little tannin and glycerine will protect the parts sufficiently.

Pedunculated, vascular, and neuromatoid growths from the mucous membrane constitute the most frequent lesions found in the urethra. The pedunculated follicular growths are found in any portion of the canal, while the other varieties are more frequently situated within the meatus, and the small vascular growths are the most common.

These growths in the urethra frequently excite a great deal of reflex irritation, which may be centred in the bladder, uterus, rectum, or elsewhere, while the true cause may be long unsuspected, and sometimes never detected. I have seen cases of vaginismus and other neuroses which seemed to be due to some uterine disorder, when the primary cause of irritation was located in the urethra. In this respect there is a close resemblance between the symptoms caused by some urethral growths, and those which sometimes result from a fissure in ano, and in every instance the true cause of the trouble may be masked by the more obvious uterine difficulty.

I am not certain regarding the true pathology of these lesions which I have described as neuromatoid growths. These are small vascular bodies of a deep red color, which become exquisitely sensitive, and produce much reflex irritation. Therefore, without direct proof to the contrary, I cannot but assume, from the symptoms presenting, that fibres of the sympathetic, accompanying the small vessels in these growths, become involved, and undergo some change. But what the change is in either nerve fibres or in the bloodvessels which produce these vascular tumors I am unable to surmise.

For all these growths the treatment is identically the same. They should be drawn up free from the deeper tissues, removed with a pair of scissors having rather dull edges, and after removal the site should be touched with the cautery or nitric acid. The point of a blunt hook heated in a spirit lamp answers the purpose. Or nitric acid may be applied from the end of a wooden match, care being taken to neutralize the action of the acid immediately afterwards by the application of a portion of cotton soaked in a solution of carbonate of soda. Whenever these growths are extensive enough to involve materially the calibre of the meatus, it is better to limit the operation, and watch the effects. It is an error, and one too often committed, to remove at a single operation so much as to narrow seriously the outlet, for this always leads to irritation of the bladder, and to cystitis, whenever the stream of urine is habitually obstructed in its escape.

Prolapse of the Mucous and Submucous Tissues.—This prolapse presents itself at the outlet of the urethra, projecting from the upper or lower portion of the passage, or occupying the entire circumference of the canal. The escape of urine from the bladder becomes necessarily impeded, and as the obstruction increases more or less tenesmus is constantly excited, which in time adds to the difficulty. Ultimately, the whole urethral canal becomes displaced, and pressed forward, or rolled out, by a prolapse of the superabundant tissue about the neck of the bladder.

The urethral canal dilates, necessarily, in proportion to the extent of prolapse, and as the circulation is obstructed the tissues become œdematous. When such a condition remains long without relief, cystitis must be the inevitable consequence, the opium habit follows, and death from disease of the kidneys will be the termination.

When the prolapse is confined to the upper side, and consists more particularly of the tissues situated at the outlet of the urethra, it may be treated as hemorrhoids are, *i. e.*, tied and cut off. To do this we are to catch up the tissues on a tenaculum, cut around the base, through the mucous tissue, ligate in two sections by a double thread, and cut off the tissue close to the ligature. Care, however, must be exercised to limit the traction to simply lifting the tissues. I have twice had a thrombus to occur as a consequence of inattention to this precaution on the part of my assistant, and in one instance the accident proved to be of a serious character. I operated on a case in the Woman's Hospital, several years ago, in which a thrombus formed from the rupture of some small bloodvessel in the cellular tissue. This dissected off the bladder from the pubes, and extended above the symphysis, and downward through the urethral outlet, dilating it to an enormous size. To prevent extensive sloughing, and to give relief, it was necessary to open the thrombus, and turn out the clot. This was done as far as it could be accomplished, and a large cavity was left, which soon became a pus-secreting surface. This gradually filled up by granulation, and the result was a radical cure of the prolapse, but only after much suffering.

When the lining membrane presents at the outlet, as a circular prolapse, it is not good practice to remove it in a mass, as is sometimes done. Only a temporary benefit would result from its removal, and the ultimate consequences would be a most serious and permanent constriction of the outlet of the canal.

Such a case should be treated as for cystitis, by making a vesico-vaginal fistula, with the view to the passage of the urine in another direction, thus obtaining rest for the hypertrophied tissues. After making the fistula, the prolapsed tissues are to be carefully returned, and pushed back into the bladder by a steel sound large enough to fill the canal. The instrument must not, of course, be withdrawn by pulling it directly out, since this would at once reproduce the original condition. It, however, can be removed without causing the prolapse, by rotating it while the fingers make firm pressure upward and backward along the course of the urethra. The tissues are to be returned from time to time in this manner, and made to contract by the application of the strong tincture of iodine. A conical ear speculum affords the best means for making the application to the urethra, and should be introduced as close up to the neck of the bladder as possible. When withdrawn it should be rotated, so as to allow the excess of iodine to follow up towards the outlet, thus rendering the application the more complete. After the tissues are returned the circulation becomes restored, and the urethra gradually contracts to its normal size. After the urethra has been restored to its normal condition, the fistula which had been made for its relief may be closed. But before this is done the original cause of the tenesmus should be sought out, and if due to hemorrhoids or fissure in the rectum, or to inflammation in the bladder, or to fissure at its neck, or to any other cause, this must be first relieved to guard against a recurrence of the difficulty.

I am satisfied that many of these cases may be permanently cured by making a button-hole slit in the urethra, through which the loose tissues may be drawn back from the meatus, secured in the edges, the excess cut off, and the opening closed. This operation would resemble the drawing of a portion of a handkerchief through a button-hole in a coat, all being drawn through except the portion grasped by the hand on the other side. Applying this principle to the urethra, it will be seen that after the slit has been properly made, traction on the tissues should be directed from before backwards. While an assistant is holding up excess of tissue a large-sized sound should be introduced so as to smooth out, as it were, the lining membrane and carry it towards the neck of the bladder, and place the canal somewhat on the stretch. While this instrument is in place, the sutures should be introduced entirely through the flaps into the urethra so as to transfix the lining membrane along the edges of the wound; the excess of tissue is then removed with a pair of scissors, and the opening closed. If this incision be made just in front of the neck of the bladder, it need not be extended towards the outlet of the urethra to a greater extent than will just allow the desired amount of tissue to be drawn through. The lining membrane must become permanently adherent along this line, after which the lax tissues will be confined within the bladder, and no prolapse could take place from beyond.

When the passage has been permanently dilated, or overstretched, it may be restored to its normal size by placing the suture further back, at the proper distance, and then denuding the edges, including a sufficient portion of the inner surface of the canal. By this means we may reduce the size of the whole canal, or any portion of it.

Fissures at the Neck of the Bladder.—We are so seldom able to determine by ocular proof the presence of fissures at the neck of the bladder, that they often escape notice, and may even be unsuspected. There are no characteristic symptoms, nor any which may not be due to the early stages of cystitis with which this lesion is so closely associated in its causal and semiological relations. The use of the microscope might determine the fact that the kidneys as well as the bladder were in a healthy condition. By exclusion only may we suspect the existence of a fissure at the neck of the bladder, for all the symptoms might be purely reflex, and due to disease situated elsewhere. I have never been able to detect a fissure by means of the endoscope, although Dr. Skene has been more successful.

My experience holds out to me only one reliable remedy for the class of symptoms under consideration, be the cause what it may. This is rest to muscular tissue, which is to be secured only by opening the bladder and treating the case as for cystitis, which condition, if it does not coexist, must inevitably be produced. The vesico-vaginal septum is to be opened in the manner already described, and as close up to the neck of the bladder as can be done without involving it. While the speculum is still in position, the edges of the incision are to be widely opened by means of a double tenaculum which is to be held afterwards by an assistant. It becomes then possible to detect these fissures by opening the folds around the neck on the bladder surface. This can be done by the aid of the tenaculum, and the examination is greatly facilitated by the use of a laryngeal mirror attached to a copper handle that can be bent at any needed angle. Although a few weeks rest and the uce of hot water injections are generally sufficient to cause a fissure to heal, it is always good practice to expedite the healing process by drawing the edge of a scalpel through the angle of the ulcerating line. This may cause some bleeding temporarily, but is no disadvantage, as it may be arrested, if too free, by an injection of hot water.

Urethrocele.—But little need be said as to the treatment of this condition; it has been already referred to under other heads. If disease of the bladder still exists, or any external cause, it must be remedied. When we have to treat simply the result of some previous exciting cause, and recognize this as consisting of more or less dilatation of the urethral canal, or of hypertrophied tissue external to the urethral wall, the treatment becomes simplified. The canal is to be lessened in diameter by the method already given, and at the same operation, even extensive hypertrophy of the neighboring tissues may be removed with a pair of scissors, and the whole closed in one line of union. Or, if deemed more advantageous, the excess of tissue may be drawn backward and disposed of as when complicated with procidentia.

After every operation of the kind it will always be well to close the perineum, if ruptured, that the parts may be properly supported, so as to guard against a return of the urethrocele.

Lacerations of the Urethra from Dilatation.—It is claimed that dilatation of the urethra offers superior advantages for the purpose of forming a diagnosis of growths on the uterine wall, and as to the condition of the bladder itself. A difference of opinion exists as to the advantages gained, but if the method should be proved fully equal in its diagnostic value to the claims advanced, still the consequences which sometimes follow dilatation are serious enough to give rise to a doubt as to its propriety. It cannot be questioned that, with all due care, laceration will sometimes occur, and that a certain number of cases are left with permanent incontinence after the operation.

At a meeting of the New York Obstetrical Society, held March 5, 1878, the history of a case of laceration, as given at the end of this article, was presented and discussed. I maintained that the same information could be gotten by examination from the vagina, or by means of conjoined manipulation. But granting all that is claimed for dilatation, my experience of two cases of incontinence out of a total of eleven thus operated on for diagnostic purposes, demonstrates the unjustifiable nature of the procedure. One of these cases I afterwards cured on closing an opening that I had made to ascertain the condition of the urethra which had been dilated, and the history will be found already detailed in an earlier part of this work. The other remained for weeks after the accident in the same condition, and was dismissed as incurable. Dr. Noeggerath, who has certainly had more experience in this operation than any one else, had been so fortunate as to produce permanent incontinence in but two out of seventy-five cases, as he stated during the discussion. I am satisfied that with any other operator, less expert, the proportion would have been greater. But accepting this 2.66 per cent. as indicative of the risk which is involved in this operation, I must still hold that the alleged advantages in no degree compensate for it, particularly since an artificial opening in the base of the bladder gives equal facilities for exploration, and is attended with no such risk of incontinence.

The rule is almost without exception, that in the event of much injury from the overstretching, incontinence of urine follows. The only exception to the rule within my knowledge, was in the case of a young woman who came under the observation of Dr. Paul F. Mundé, and who had so much cicatrization following the dilatation, that her bladder could only be relieved by the regular use of the catheter. The doctor placed this case under my care, and as a choice of the lesser evil, and to avoid cystitis in the future, I made a permanent opening in the base of the bladder.

Incontinence of urine never occurs directly from laceration of the urethra proper, nor is it a consequence always of the injury at the neck of the bladder, since I believe that more or less tearing of the tissues must occur in every instance in which the canal is fully dilated. The urine continues to be lost only when the direction of the cicatricial line interferes with the proper closure of the folds at the neck of the bladder, to which, as has already been stated, the retentive power is wholly due. The whole urethral tract, as far as the neck of the bladder, may be lacerated without necessarily interfering with the retentive power; but if partially lacerated, so far as to increase the diameter and leave the canal patulous, a condition is induced which will, in all probability, lead to inflammatory changes in the bladder by which the tissues of the urethra will be drawn so far back as to prevent the proper falling together of the folds, and the retentive power will be lost. When treating of certain forms of vesico-vaginal fistula I described a like condition. In these cases the torn urethral tissue pass through the septum at a right angle to the natural direction of the canal; this then becomes funnel-shaped, with its opening presenting towards and into the bladder. I have seen other instances of laceration, when the canal was left dilated in the anterior portion, and with some contraction about the meatus, but as the neck of the bladder was not injured there was no incontinence. This condition must always lead to cystitis, as a constant irritation is kept up by a small quantity of stale urine being retained within the dilated portion.

I have had, comparatively, little experience in repairing these injuries. In one instance I removed successfully such a pouch by opening the urethra and restoring the canal to its normal size. In another instance, when the neck of the bladder had been permanently drawn back, as I have described, I lengthened the urethra with success. The third case I give somewhat in detail, as it fittingly closes this subject with a description of the pathological changes found in the advanced stages of all the conditions which have been treated of as complicated with cystitis:—

Case XLIX.—Jane Morton, aged 40, unmarried, was admitted to the Woman's Hospital, Sept. 27, 1877.

Menstruation had been normal since its first appearance. Without any known cause, cystitis gradually came on about six years previous to her admission. For her relief an artificial vesico-vaginal fistula was made about two years afterwards in Brooklyn. This gave her entire relief, but the opening was closed too soon, and the cystitis returned. The urethra was dilated at the same time, since which she has been unable to retain the urine, and her suffering is greatly increased.

A physical examination disclosed laceration of the urethra, and an irritable and contracted bladder. The uterus and vagina were in a normal condition. Examination of the urine gave evidence of an irritable bladder, but none of any kidney difficulty.

At first attempts were made to aid the retention of urine by maintaining pressure against the symphysis with a soft India-rubber pessary, but without success.

Nov. 6. Made an artificial vesico-vaginal fistula, and closed the laceration through the urethral outlet. From thickening and contraction of the bladder the urethra was drawn backward, and presented the appearance as if a gimlet-hole had been made through the septum just behind the pubes. The laceration was not only closed, but the canal was lengthened in a forward direction fully half an inch.

13th. The sutures were removed, and the union found perfect.

Dec. 4. Closed the fistula with fine sutures. This was done as no evidence of positive disease of the kidneys had been detected, nor of the bladder, except a little at the contracted portion, which might have resulted from the constant escape of urine. I was disappointed, however, to find, after closing the fistula, that the urine escaped from the urethra as before.

7th. Violent paroxysms of vomiting came on on the second day after the operation, and the urine became scanty in quantity. Examination of the urine now showed a large amount of pus, an alkaline reaction, and a specific gravity of 1.006. Granular casts from the tubes were found, and columnar epithelium from the pelvis of the kidney.

8th. Patient was unable to retain anything on the stomach. The vomiting or retching continued, except when controlled by morphine, and was of that explosive character peculiar to uræmic poisoning. Thus far there had been no cerebral symptoms, and vision continued perfect, and there was no headache. There had been no movement from the bowels since previous to the operation, although injections had been several times administered. During the day the temperature ranged from 99°–101°, and the pulse from 90–110. Towards night the tongue became dry, and the general appearance that of typhoid. At 9 A.M. administered by enema four drops of croton oil in a little glycerine, and by the rectum two ounces each of beef-tea and brandy every three hours, and this was continued throughout the next day, during which the temperature and pulse remained unchanged, and the vomiting continued. During the evening symptoms of cerebral disturbance were noted, and she began to sink. Between 1 and 2 o'clock P. M. she had several copious movements of the bowels, due, it was thought, to the action of the croton oil. At 4 P. M. it was discovered that there existed a complete suppression of urine; she was gotten into a hot bath without delay, and by 6.30 the skin began to act freely. At 9 A. M. the pulse reached 130, became feeble and intermitting. Gave brandy and wine of digitalis hypodermically, and this was repeated as needed to steady the action of the heart. By 11 o'clock P. M. the pulse had been reduced to 115 per minute, and was held at this rate, by the use of the digitalis, until 5 A. M., *Dec.* 10, when it could be no longer influenced. Coma began at 8 A. M., the vomiting had ceased, and there had been no convulsions; the skin was dry, the pulse feeble and intermitting. She was placed in a vapor-bath several times during the day, but without affecting the condition of the kidneys, and the temperature of the body remained about 101°, with but little variation. The coma became complete at 4 o'clock P. M., and she died within an hour afterwards.

The autopsy was made by Dr. Maxwell, who furnished the following statement of the condition: Jane Morton, examination, Dec. 11, 1877. Body medium stature, fair nourished, rigor marked, no anasarca. Examination of urinary organs only.

Pyo-nephrosis, encapsulated right kidney, occlusion and atrophy of right ureter; dilatation and ureteritis of left. Chronic cystitis, catarrhal and interstitial.—Left kidney. Abnormal adhesions of fatty to fibrous capsule; the latter was moderately attached to the surface of the kidney, but sufficiently so to remove small portions of the cortex on opening. The kidney measured five inches in length, one inch and a half in thickness, and one inch and three-quarters in width. The surface was lobulated, the summits of the lobules were pale yellow, and the depressed portion reddish in color. On the posterior surface three or four depressions were formed by falling in of the kidney substance. A section showed largely dilated pelvis and calyces, with resulting atrophy from pressure of the parenchyma of the organ. This condition was specially marked at either end, and on the posterior surface. The structure at the upper portion of the kidney was only about two lines in thickness, and at the lower end about three lines. The pelvis and calyces contained a small amount of yellowish-brown puriform liquid of an offensive urinous odor. The walls of the pelvis and calyces were slightly thickened, and the mucous membrane presented evidence of an intense pyelitis, with small patches of pseudo-membrane, mostly found in the dilated calyces. The greater portion of the kidney was markedly atrophied, except two or three pyramids, in the central portion, which still remained of comparatively normal size. Here the pyramids and cortical substance were of pale yellowish color, the columns of tubules were much swollen. The compressed portions showed traces of pyramid and cortex only.

The left ureter was one-half inch in diameter throughout, and partly filled with the same material as found in the pelvis. It contained detached particles of pseudo-membrane from the calyces. The coats were hypertrophied, especially the muscular one, and the mucous membrane presented evidence of chronic ureteritis.

Right kidney. There were firm adhesions of the fatty to the fibrous capsule, and it was impossible to remove the latter. This kidney was four inches long, one inch and three-quarters wide, and one inch and a half thick. It presented a lobulated appearance, and gave on the surface a marked sense of fluctuation, except as to one nodule, on the outer border, which was hard. A section showed the kidney to have been the seat of an encapsulated pyo-nephrosis. The dilated calyces were filled with a semifluid cheesy pus. The solid portion noted was a cretaceous cheesy mass, encapsulated. The pelvis is obliterated, and its site occupied by condensed adipose tissue.

The right ureter was occluded at the commencement, and traced into a cicatricial mass on the pelvis. The whole ureter was atrophied, and its canal impervious, except for a short distance in the upper portion. Its vesical termination was involved in a firm, radiating pigmented cicatrix.

The bladder was contracted, empty, and its capacity less than half an ounce. Its walls were hypertrophied at the base and neck, while the fundus was atrophied. Evidence of chronic interstitial cystitis, with streaks of connective tissue between muscular bundles. The sutures were still in the edges of the fistula, but no union had taken place. The mucous membrane showed all the evidences of chronic cystitis.

The urethra was nearly one-half inch in diameter. Its mucous membrane was thickened and pigmented. About one-quarter of an inch below the vesical orifice three or four deep pockets of mucous membrane were found, which resembled hernias of the mucous membrane from rupture of the muscular coats, and were evidently the result of laceration attending dilatation of the canal.

Death in this case was undoubtedly hastened by the anæsthetic, which had been used in the absence of any evidence of kidney disease, so far as could be determined by the aid of the microscope. The experience in this case has impressed me with the necessity of using the ophthalmoscope as a diagnostic aid. With this instrument changes in the circulation of the retina can often be detected where the individual has suffered for any length of time from Bright's disease.

In the advanced stages, the microscope cannot be relied upon alone, since the secreting portions of the kidney may have been destroyed to such an extent that no greater number of casts would be presented than at an earlier period of the disease. It is always advisable to make a microscopic examination, but before doing so diuretics should be administered for the purpose of increasing temporarily the action of the kidneys. If it be possible to accomplish this, casts and other evidence of disease will be thrown off in larger quantities under this stimulated action than would occur from the ordinary functioning of the organ. Several specimens of urine should be examined in the same order as excreted. If the kidneys are healthy no effects leading to suspicion of disease would be produced by this increased action. In the early stages of Bright's the evidences of disease would be the more likely to lessen under the same influence, while, if the disease were already far advanced they would be increased.

CHAPTER XXXV.

CYSTITIS—STONE IN THE BLADDER AND URETHRA.

This disease is insidious in its course, and has its origin in so many different causes that it is frequently far advanced before it is recognized. The chief exciting causes are:—

Exposure to cold resulting either in inflammation of the bladder itself or in [illegible]; direct violence; neglect in emptying the bladder during parturition; the habit of long retention of the urine; the early closure of a vesico-vaginal fistula, before the tissues have regained a healthy condition; different displacements of the uterus acting as mechanical sources of irritation; fissure in anus and hemorrhoids; some forms of dyspepsia in which the urine becomes irritating; polypi or other growths; and ulcerations in the urethra.

Other causes exist by which a continued irritability of the bladder may be kept up until what is generally termed chronic cystitis becomes established, but it is unnecessary to enumerate them.

When resulting from exposure or from violence, the whole mucous membrane may become inflamed from the beginning of the attack, constituting a catarrh of the bladder.

But the initial point of irritation is, as a rule, at the neck of the bladder, and the lining membrane of the viscus proper does not become involved until at a comparatively late stage of the disease.

A poor woman may not have had the attention of a physician during a prolonged labor, and her bladder may remain unemptied sometimes for days. The bladder must rise in the abdomen as the accumulation goes on, and a continued traction is thus exerted on the neck of the bladder as it is dragged from under the arch of the pubis. Inflammation is established which does not subside after the bladder has been emptied, but continues to excite a frequent desire to urinate. As a consequence of the straining effort to force out each drop of urine, a crack, or fissure, frequently forms at the bottom of one of the folds of loose tissue about the neck of the bladder.

Whenever the uterus is completely retroverted, the cervix is either left pressing directly against the neck of the bladder, or it is dragged upward and backward. If the uterus is too large and sags in the pelvis, or if the upper portion of the vagina is relaxed, or the perineum lost, so as to no longer furnish support, an irritation will be excited. Whenever the uterus is anteverted and enlarged so as to prolapse, the effect will be the same. It has been shown in the chapter on displacements that whenever the uterus reaches a certain point of prolapse, the whole weight is suspended from the neck of the bladder. This excites a constant desire to empty the bladder, but as no relief follows, the constant effort in time gives rise to a painful tenesmus.

From whatever exciting cause the difficulty may arise, the bladder long remains a patient sufferer before it becomes seriously diseased. In the beginning a profuse local secretion takes place, especially if the urine be markedly phosphatic, and mucous accumulations follow. At first the urine is to a great extent evacuated, but, in time, the frequent efforts to force out the mucus induce inflammation and thickening at the neck of the bladder. As a consequence, a certain amount of stale urine is always retained, thus increasing the irritation. At length the vesical walls become thickened, the mucous membrane ulcerated, infiltration of urine to some extent occurs, abscesses form, and pelvic cellulitis is not an infrequent result. Long ere this the œdematous and thickened tissues have so greatly obstructed the mouth of the ureters that the urine can no longer flow freely into the bladder. The ureters often become enormously distended, the inflammation extends along them to the kidneys, these organs at length become disorganized by the accumulation of urine, and death ultimately results from uræmic poisoning. Before the last stage of the disease has been reached, the poor woman has experienced, through a series of years, an amount of suffering both of body and mind unequalled, I believe, in any other infirmity to which humanity is subject. To alleviate this suffering, these women soon become addicted to the use of opium, and it is almost incredible to what degree of tolerance to this drug they may attain. I have frequently noticed a tendency to a mucous diarrhœa which could be attributed only to the excessive use of opiates; and the frequent desire to evacuate the bowels greatly aggravates the condition of the bladder.

Before considering the proper mode of treatment let us briefly enumerate the chief anatomical points with which it is important that we should be familiar.

On looking into the bladder from above, it will be noticed that from all directions the parts converge towards a space at the bottom which is near the base of the bladder.

The base proper of the bladder may be represented as a triangle, the mouths of the ureters being situated at each extremity of the base, and the vesico-urethral orifice at the apex. This triangular space maps out the surface where the bladder and vagina are in the closest contact; elswhere they are connected by cellular tissue. Just outside of the line of the ureters, in the sulcus on each side, run the larger blood-vessels to and from the lower portion of the uterus and neighboring parts. I have made a number of post-mortem examinations of the healthy bladder, both *in situ* and after the removal of the pelvic organs, and in no instance have I found the distance from the mouth of one ureter to the other, or from either to the orifice of the urethra, greater than an inch, the space thus included forming a triangle of equal sides. When disease has existed and the bladder has been long contracted, the distance between these points in all probability is somewhat lessened. In a cross section, except at the base, the vagina and bladder occupy to each other about the same relation as two cylindrical bodies would do when placed in contact. This anatomical relation must be fully appreciated in its bearing on the mode of operation to be practised for the relief of cystitis.

The female bladder has no sphincter proper, and the retentive power is chiefly due to the loose superabundant tissue about the neck, which falls together in a number of folds. As the urine accumulates the bladder rises in the pelvis and the retentive power is increased by the urethra being drawn up against the arch of the pubes. When the bladder becomes very much distended, these folds all disappear in the dilatation, and the urine dribbles, although the woman may be unable to empty the bladder on account of the traction on the urethra under the pubes. But as the healthy bladder beomes moderately distended and lifted in the pelvis the lower portion assumes a funnel shape. The action of the abdominal muscles then has the effect of concentrating the pressure on the column of urine urging it into the neck or nozzle, and the cavity is rapidly emptied without notable effort. When inflammation has occurred this great mobility of the parts is lost, and it requires more of an effort to empty the bladder. The shape of the viscus changes under the influence of disease so as to resemble more that of the male bladder, somewhat of a pouch forming in the posterior portion, thus admitting of the retention of more or less urine which may decompose and add to the difficulty.

Treatment.—As long as the case is one of irritation of the bladder, due to some exciting cause which can be recognized, and the microscope fails to disclose evidence of pus or of casts from the kidneys, we may delay any surgical procedure.

We must first operate on any fissure or hemorrhoids that may exist. If necessary a pessary may be fitted to lift the uterus from the floor of the pelvis, even if in so doing the organ becomes more anteverted, for relief will be obtained when the neck of the bladder is relieved of the weight. At the same time the instrument must be so shaped in front as to avoid all pressure on the urethra. If the upper portion of the vagina be over-stretched so as to allow of prolapse, relief may be gained from some modification of the operation for procidentia, by which the excess of vaginal tissue is turned in and allowed to retract. With partial or complete cystocele or rectocele, the appropriate operation at the vaginal wall will be necessary, as well as closure of the perineum.

In the local treatment of the bladder the main dependence rests in the frequent and proper manner of washing out the cavity. This operation the surgeon should perform himself, if possible, using simply warm water in large quantities to be introduced by means of a siphon syringe, placed at a certain height, or injected from a Davidson's syringe with great care, using a double catheter for whichever instrument is employed. After the injection, if the pain has been increased, it will be diminished greatly by a solution of morphine thrown into the bladder. Although the absorbing power of the bladder is very limited in a healthy state, yet in this condition it is sufficient to be sensibly affected by the anodyne. When the injection of water cannot be borne without increasing the irritation of the bladder, or where there had been no marked improvement in the case after a reasonable time, a surgical operation must be resorted to. This consists in making an opening in the vesico-vaginal septum through which the urine may escape into the vagina, as rapidly as it enters the bladder. In this way absolute rest of the organ is secured and the inflammation will subside. The patient should be given the option of submitting to the operation or not, being assured that there is a reasonable hope of success on the one hand, or on the other inevitable death from extension of the disease to the kidneys. Many objections have been made to surgical interference in these cases. The chief danger is in the involvement of the kidneys, and this has been entirely overlooked, the exceptions taken being based on theoretical grounds alone. The advance to be made in the future will render apparent the necessity for an early resort to the operation before permitting a comparatively simple condition to pass beyond the reach of any remedial means yet known to the profession.

In the winter of 1858 I removed, through an artificial opening made in the vesico-vaginal septum, a calculus from the bladder of a patient in the Woman's Hospital.[1] She had been an inmate of the institution several years before with a vesico-vaginal fistula, which was closed previous to her discharge. As the bladder was in a diseased condition, by the advice of Dr. Sims, the artificial opening was left for the greater facility afforded in the treatment for restoring the organ to a healthy state. This idea was a new one to me at that time, and to Dr. Sims, I believe, is due the credit of the mode of treatment for cystitis in the female resulting from stone.

While temporarily in charge of the Woman's Hospital, during the summer of 1861, I performed this operation with the view of securing to the bladder rest from persistent tenesmus, in a long-standing case of cystitis following exposure. I was assisted by Prof. James P. White, of Buffalo, and at a meeting of the New York Obstetrical Society, in December, 1870, when he was present as an invited guest, the doctor stated the fact, and that he happened also to be present at the final closure. The idea at the time was supposed to be original, and that it was the first case of cystitis in the female in which the bladder had been opened for the specific purpose of obtaining rest, and as a distinct procedure in the course of treatment. So clear were my views that to the present day there has been no modification of the plan as carried out in the first case.

Dr. Willard Parker, of this city, presented at the annual meeting of the New York State Medical Society for 1867 a paper on "Cystitis and Rupture of the Bladder treated by Cystotomy," which was published in the Transactions for that year. He states that on Jan. 3, 1846, he performed lithotomy on a male when he was unable to remove the stone, but the cystitis was relieved by the free escape of the urine through the opening. At the end of three months a fresh attack of cystitis came on, the kidneys became involved, and death resulted. This case seems to have been instrumental in drawing his attention to the subject. Nov. 23, 1850, Prof. Parker operated at Bellevue Hospital on a case of chronic cystitis in the male. He states:[2] "The object in view was to open a channel by which the urine could drain off as fast as secreted, and thus afford rest to the bladder, the first essential indication in the treatment of inflammation." The conception of treatment was perfect, and there has been no later advance made in the pathology. The patient died in a few days, and the autopsy revealed the fact that the kidney had undergone degeneration. Although a favorable result was not attained, it clearly establishes Dr. Parker's claims to priority for this mode of treatment of cystitis in the male.

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[1] The history of the operation, as given in this chapter, has been taken from a paper, "Chronic Cystitis in the Female and Mode of Treatment," as read by me before the State Medical Society, and published in the American Practitioner for Feb. 1872.

[2] New York Medical Journal, 1851, vol. vi., as reported by Stephen Smith, M.D., Assistant Surgeon to the Hospital.

Previous to the reading of this paper, before the State Society in 1867, I had been ignorant of Dr. Parker's views on this subject, and was unable, until several years after, to obtain a copy of the journal in which the case was printed before I became a practitioner in New York.

In July, 1868, I published my work on Vesico-Vaginal Fistula, containing the histories of several cases of cystitis which had been treated by making an opening for the free escape of urine.

At the meeting of the State Society, Feb. 7, 1871, Dr. Bozeman presented a paper on "Urethrocele, Catarrh, and Ulceration of the Bladder in Females," which was published in the New York Journal of Obstetrics for Feb. 1871.

Dr. Bozeman details the history and successful result of an operation for the relief of cystitis, performed January, 1861, the artificial opening having been closed the following June. The patient was cured, and nine years afterwards there had been no return of the disease. It is stated: "To Prof. Willard Parker is due the suggestion of opening the male bladder for the relief of catarrh, and this encouraged me to extend the practice to the female bladder, as I have described. Dr. Emmet and other American surgeons have since adopted the practice in case of vesical catarrh in the female, and I doubt not with equal success." . . . "Delay in the report of my case of ulceration was due to the suspension of all medical journals in the South during the war," etc. This statement is unfortunately calculated to give the impression that the American surgeons who have practised this mode of treatment since 1861 were indebted to Dr. Bozeman. With all due respect for his claims, this is not correct, for, until his paper was presented, he gave the profession no opportunity of knowing that he had ever operated. He has certainly not done justice to himself in so long withholding his claims, and he can scarcely be ignorant that this operation has been the practice at the Woman's Hospital previous to and from the time of his coming to New York, immediately after the war.

In the case upon which I operated in 1861 the opening soon closed, and with its closure no further improvement in the condition of the patient took place. I shortly afterwards made a larger opening through which the urine freely escaped. Ten months later I closed the artificial opening, as the thickened condition of the bladder had then disappeared. I have never seen a case of disease of the bladder so extensive as this was, without the coexistence of kidney trouble. The mucous membrane of the bladder had, to a great extent, been lost, and the walls had become so hypertrophied that the bladder, as a hard mass, could be felt contracted behind the pubes, and was exceedingly tender on pressure. This case had been of many years' standing, and her suffering had made a wreck of both body and mind. She was perfectly cured, and came under observation frequently until about 1869, since which time I have lost sight of her.

Case L.—During the autumn of 1862, shortly after her arrival in this country, an English woman, suffering from cystitis, was admitted to the Woman's Hospital. She refused to submit to any surgical procedure, and shortly afterwards died in consequence of the diseased condition of the kidneys. (I mention the case because she had been for some time under the care of Sir James Y. Simpson previous to leaving Great Britain, and the chief objection made to me and others against an operation was that so high an authority as Prof. Simpson had never intimated the necessity for such a procedure. The credit of this mode of treatment has been recently claimed for Prof. Simpson by Mr. Lawson Tait. Whether the idea after this date occurred to him, or that he was really indebted to this country for it, is of little consequence. But by this case the fact is proved that previous to the summer of 1862 he was ignorant of the method, and treated his cases simply by injection into the bladder.)

Case LI.—About 14 years ago, in my private hospital, I closed the lacerated perineum, of a woman, who seemed otherwise in excellent health, and was sent to me, I believe, by Dr. Varick, of Jersey City. Ether was administered, but she never regained entirely her consciousness, and died with well-marked symptoms of uræmic poisoning about 32 hours after the operation. It was found that she had Bright's disease, both kidneys being so involved, that the secretion of urine was arrested, and only a drachm or two was found in the bladder.

This case was reported, and in the report I called the attention of the profession to the greater necessity for examining the condition of the kidneys than that of the heart. Since then I have had at least five deaths to occur from uræmic poisoning in public and private practice, and these, perhaps, might not have occurred, if my assistants had been able to examine, or had appreciated the importance of examining, the urine before the anæsthetic was given.

I established the rule, when in charge of the Woman's Hospital, that the urine should be examined in every case before an anæsthetic was administered. The result was that in a number of instances unsuspected disease of the kidneys was detected, and the operation was performed with the aid of opium, and without an anæsthetic.

To the effects of the anæsthetic I attribute the chief danger attending the operation in the advanced stages of cystitis, although, on account of the hypersensitive state of the bladder, it is almost indispensable; when the kidneys are barely able to perform their function sufficiently well to preserve life, there is great danger in imposing additional work upon them, and, whenever they fail, death from uræmia must rapidly follow.

It has been denied that the kidneys take an active part in the elimination of ether from the blood, but I am convinced that this view is incorrect. Hours after having performed some prolonged operation I have often detected in my own urine the smell of ether which had been used. I have had no experience with the use of any other anæsthetic in this condition, but on theoretical grounds would consider the use of the nitrous oxide as the least objectionable, and particularly as the operation is one of so short duration. Unfortunately we cannot judge in any case of long standing as to the actual condition of the kidneys, so that the consequences which may follow must be fully appreciated both by the operator and the patient.

The operation as practised for the relief of cystitis is in itself a simple one, and if resorted to before the disease has advanced so far as to involve the kidneys, is as free from risk as any in minor surgery. Even under the more unfavorable circumstances the risk of the operation is justifiable, for by it life may be prolonged, and a great degree of comfort obtained in allaying the persistent efforts to empty the bladder.

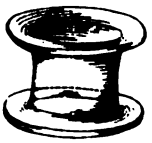
The operation is to be performed under the influence of an anæsthetic when possible, with the patient on the left side, and the anterior wall of the vagina fully exposed by means of a large-sized Sims's speculum. A sound somewhat abruptly curved an inch and a half from its extremity, must be introduced into the bladder and held by an assistant. While the point of this instrument is firmly pressed in the median line against the base of the bladder, a little behind the neck, the projecting tissue on the vaginal surface must be seized with a tenaculum, and divided by a pair of scissors directly on the point of the sound until it can be passed through into the vagina. With the sound remaining in the opening as a guide, one blade of a pair of scissors should be passed into the bladder, and the vesico-vaginal septum be divided backward in the median line. By this mode, especially where the vagina is of a natural size, the operation is extremely simple, and is completed in a few moments. The object in cutting on the point of the sound is to be sure that the bladder and vaginal surface are divided in corresponding incisions, for there is so much mobility of one surface over the other that it is exceedingly difficult to enter the bladder unless the parts are transfixed.

The mode of operating, as described, can be but little improved upon as to simplicity. The median line has been preferred for the location of the incisions, since it is not likely to include any large bloodvessels unless the opening be extended too near to the cervix uteri, or to the neck of the bladder. In theory, there is no necessity for an opening larger than that equal to the area of the two ureters; in practice, however, it is found that it must be greater at first than this, from the fact that, in spite of all the care that can be taken to prevent it, a large portion of it will close too soon. Moreover, at times it is a great advantage to have an ample opening through which the accumulated mucus in the bladder may be easily washed out. It is very seldom that much bleeding follows this operation unless an [illegible] is wounded, or the incision is extended too far in either direction. When a large vessel has been divided, it will either be a [illegible] of the circular artery of the cervix uteri, or one given off from the [illegible] artery. Bleeding in either direction is readily arrested [illegible] suture, so as to include a fair amount of tissue [illegible] the wound and twisting it sufficiently tight. [illegible] be bent flat in accordance with directions [illegible] the hook, so that it shall not be an addi- [illegible]

[illegible] the cutting out of a circular piece, and [illegible] the opening would then never entirely close [illegible] the size of the piece as recommended by him is too [illegible] to remove. The general operator [illegible] the anatomy of the parts, and remove but a [illegible] will be apt to include the mouths of [illegible] the neck of the bladder, and to open laterally into the [illegible] the vagina outside of the bladder.

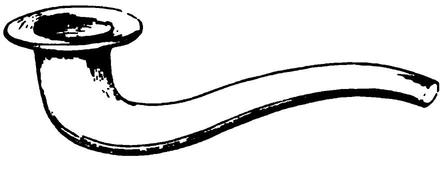
Various means have been resorted to for the purpose of keeping an artificial opening patulous. I have used in some cases with advantage a stud, or eyelet, made from glass tubing half an inch in diameter, and not unlike a spool in shape, which is buttoned into the slit. The portion of the flange to remain within the bladder requires to be but little more than a slight flare, with the edge turned over to keep the instrument in place, while the vaginal rim may be larger to prevent its slipping into the bladder. It will remain loose, and with sufficient play to prevent the parts from healing up too tightly around it. For its removal only a pair of forceps is necessary, by which one side may be turned up for the other to escape. If used it should be made light, and only from the finest quality of Bohemian glass. It is really a most useful instrument, but I have been obliged to abandon it on account of the difficulty of having them made from a proper quality of glass. If the least amount of lead or any other impurity exists in the glass, it will in a few hours become encrusted with a sabulous deposit from the urine, and will increase greatly the irritation. As a rule, therefore, I think it advisable at first to rely upon the careful introduction of the finger night and morning, but after a few days, when the irritation of the parts has somewhat subsided, the urine is in better condition, and the incision beginning to close, the glass stud may be used with greater advantage. As a substitute for the button, Dr. Bache Emmet, one of the assistant surgeons to the Woman's Hospital, has employed a glass instrument of the shape and size represented in Fig. 118, by which the urine is conducted to the vaginal outlet. It is introduced with less difficulty than the eyelet, and in many cases it answers better, especially where it is advisable to keep the urine out of the vagina and from recently cut surfaces, and it answers well while the patient is remaining quiet in bed.

Fig. 117.



Emmet's cystitis eyelet.

Fig. 118.



Bache Emmet's fistula tube.

Prof. Pallen recommends opening into the bladder with the Paquelin thermo-cautère as follows:[1]—

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[1] Kolpo-cystotomy, or Artificial Vesico-vaginal Fistula, by Montrose A. Pallen, A. M., M.D., etc. Am. Jour. of Obstetrics, etc., vol. xi. April, 1878.

"The main difficulty hitherto has been to keep the incision open after the use of the scissors or knife. Artificial means must be resorted to, such as an India-rubber tube passed from the urethra through the opening, which is annoying and painful, or a glass button introduced, which is difficult to retain, and when retained is apt to beget vesical tenesmus. I believe the use of the actual cautery at a red heat will be found to answer all purposes." "If the platinum tip of the cautery be heated to a white heat, it cuts through as rapidly as the knife, and, therefore, hemorrhage is to be expected. Besides the thin slough produced by white heat might peal off and union ensue. To avoid both bleeding and contraction, the tip should be raised to a red heat only, and passed slowly along the side of the proposed opening, dividing first the mucous membrane of the vagina, and then held still for a moment or so to allow the adjacent vessels to contract and become occluded. The submucous connective tissue is then burned, and afterwards the bladder wall itself. Extreme delicacy of manipulation is required upon the part of the surgeon, lest he burn directly into the cavity of the bladder, which should be avoided in order to prevent hemorrhage, contraction, and subsequent union."

I have had no experience with this mode of treatment, but feel confident that without the greatest delicacy of manipulation, serious results might follow its use. Should the bladder be contracted as it usually is in these cases, the fundus might be in such close proximity to the point of entrance of the cautery as to be also involved. This objection, however, could be overcome by placing the patient on the knees and elbows, and by introducing a catheter into the bladder, so that it may be dilated by atmospheric pressure.

I am inclined to advocate the use of the cautery to the extent of applying it to the raw edges after performing the operation in the usual manner, the edges being rolled out with a tenaculum. To use it might prove a valuable means of keeping the fistula open. Contraction to a great extent would doubtless take place afterwards, but the edges would be in a condition less likely to be irritated by the urine after the slough had been thrown off, than would be the case with surfaces which had just been denuded. I should also anticipate benefit from it as a counter-irritant, unless the cautery were so freely applied as to establish a degree of inflammatory action which could not be limited to the edges of the wound.

The usual routine of treatment, in a general way, is to wash the bladder out thoroughly every day by placing the patient on the back with a bed-pan under her hips. Two fingers of the left hand of the operator must press back the perineum while they are inserted into the fistulous opening to separate its edges. Large quantities of warm water must be then carefully thrown into the bladder by means of a Davidson's syringe held in the other hand. The smaller nozzle of the instrument will be the most useful, and may be introduced either through the urethra or directly into the opening. Afterwards the point of a sound must be drawn along the angles of the opening to retard its closure.

The following cases are given in detail, to illustrate some of the difficulties and complications which attend the treatment:—

Case LII.—Mrs. B., aged 24 years, was admitted to the hospital from Goshen, N. Y., Oct. 17, 1868, with a vesico-vaginal fistula of four months' standing, having followed a labor of 30 hours. There had been an extensive loss of tissue, and after three operations she was discharged cured, March 31, 1869.

A few weeks after her discharge she began to suffer from irritation of the bladder. This increased, and occasionally the urine was mixed with blood. She was pregnant, and was delivered with forceps Feb. 14, 1870. Gradually the difficulty with the bladder became greater, and she was again admitted to the hospital March 31, 1871, suffering fearfully from cystitis. It was with the greatest difficulty and suffering that a double catheter could be introduced for the purpose of washing out the bladder, and this finally became so great that it was necessary to administer an anæsthetic every other day, in order to effect it properly. As but little improvement had taken place on April 21, I made a traverse opening just beyond the neck of the bladder, one inch in length, and somewhat crescentic in shape. This was done in consequence of the great loss of tissue, leaving insufficient room between the cervix and neck of the bladder for an incision in the axis of the vagina. When the finger was passed into the bladder, its walls were found much thickened, the mucous membrane destroyed to a great extent, and coated with the most offensive phosphatic deposit, which when removed caused bleeding from the surface below. Her sufferings were so great, even after the operation, that it was necessary to give her an anæsthetic every other day before washing out the bladder, and often a gallon of warm water was used at a time before the deposit could be removed. A week after the operation I introduced a glass stud in the opening to keep it from closing. The injection was continued daily until August 7, when the glass instrument was removed, as it had begun to excoriate the posterior wall of the vagina. Her general health improved rapidly, and she was free from pain, except during the time the bladder was being syringed out. When the finger was passed within the bladder its surface was felt to have become smooth, but was still tender on pressure; yet the improvement had been very great. The injections were renewed and continued until Oct. 1, half a drachm of carbolic acid being added to

urethra, so that if the cystitis had not been cured some evidence of it would have remained.

The sound could be passed into the bladder to any point within its cavity, without causing the slightest pain or irritation. In April, 1872, one year after the first operation, the opening was closed, and she remained well afterwards.

Case LIII.—Mrs. O'B. aged 35, was admitted to the Woman's Hospital Nov. 8, 1867. Menstruated for the first time at 16. Married at 17, and gave birth to her only child within a year afterwards.

Four months after marriage her husband died.

Her general health from childhood had been delicate. Three years previous to admission she had received a severe fall, and from that time had never been free from irritability of the bladder. This gradually increased, until at length she had constant pain, and was obliged to empty the bladder at least every half hour during the night and day. The urine was sometimes clear, but generally of a dark, fuliginous hue, with often some sediment, and was frequently tinged with blood.

She was found upon examination to be suffering from cystitis of long standing, and to have some thickening of the walls of the bladder. The uterus was retroverted and fixed in position from some previous attack of cellulitis. The organ was normal in size, but the cervix was indurated and small, and the os nearly closed. The microscopic examination indicated that the kidneys were yet in a healthy condition.

An attempt was made to correct the position of the uterus, for the cervix pressed upward against the base of the bladder, and might continue to prove a source of irritation. The finger, in the rectum or vagina, was the only means used to lift up the fundus, for fear of exciting the old pelvic inflammation. This was only partially successful. The cervix was blistered from time to time with acetic solution of cantharides, with the view of lessening the induration, and sponge tents were also carefully used for the same purpose, and to relieve the dysmenorrhœa by opening the os. Her general condition was carefully looked after. With the view to its effect on the bladder, she was placed at one time on a mixture containing ten grains of tannin to each dose. This frequently caused the urine to become acid. When this ceased to have the effect she was placed on a mixture containing benzoic acid, the formula of which was given when treating of vesico-vaginal fistula (see page 619). Large doses of old muriated tincture of iron were used, an old preparation being selected, because, as has been stated, it contains more free acid than the fresh preparations. I believe she at one time readily took a drachm three times a day. An infusion of the triticum repens was also freely given for some time.

March 10, 1868. In consequence of a slight exposure to cold, she suffered from a severe attack of pelvic peritonitis, lost what little benefit had been gained by treatment, and was several months convalescing. At length, after nearly seven months' local treatment in washing out the bladder daily, and having exhausted every local and constitutional resource with but little benefit, an operation was proposed. After fully explaining to the patient the risk of life, in her debilitated condition, should the operation again light up the pelvic inflammation, the products of which had not yet disappeared, she decided to submit in spite of all the dangers, in preference to remaining in her then sad condition.

June 2. The patient was placed under the influence of ether, and with concurrence of Drs. Alfred C. Post, one of the consulting surgeons, and H. P. Farnham, her former physician, the artificial opening was made. The incision was an inch and a half in length, extending from the neck of the bladder nearly to the cervix uteri. The interior of the bladder was found in the usual condition, with the walls thickened and corrugated, but with less ulceration of the mucous membrane; the latter condition being due probably to the length of time she had been under treatment.

July 18. She was discharged, greatly improved both in her local and general condition, to return in the autumn. With the greatest difficulty the fistula had been kept open, and had become so small as scarcely to admit the finger.

October 27. She was readmitted to the hospital, having been under observation during the summer as an out-door patient. Her general health had not improved to any great extent, and she had suffered greatly from the fistula, which had twice nearly closed. The adhesions were broken down so as to admit the finger, and at length it remained permanently open, large enough to admit a No. 6 catheter, through which the urine escaped. During the winter the regular treatment was kept up, with the effect of much improving the cystitis, and the walls of the bladder became softer. Much thickening, however, and induration at the neck of the bladder remained, with tenderness in the urethra, making it unbearable to introduce a catheter into the canal.

June 4, 1869. For several months previous a solution of morphine, containing eight grains to the ounce, had been thrown into the bladder, after washing it out with warm water. As she lay on her back, it was thrown somewhat as a spray through the fistula, so as to wet the upper portion of the bladder, out of reach of the urine, and the excess flowed off below. This plan was followed with great benefit, so that there was decidedly less tenderness on pressure in every portion of the bladder, but she continued to complain whenever a catheter was introduced.

9th. A relapse occurred, apparently without cause, a constant desire to empty the bladder coming on, although the urine all escaped freely by the vagina. Dr. Robert Newman kindly examined the bladder for me with the endoscope. Its mucous membrane was found to be in a normal condition. As the instrument was slowly introduced into the urethra, every portion of the canal was carefully inspected. At first, nothing could be found, but at length a minute granular point was detected on the left side, about an inch from the orifice, intensely red, and painful to the touch. Churchill's solution of iodine was applied, which gave much pain, lasting eight hours.

16th. The patient was again examined, and it was found that no improvement had taken place. The iodine application was repeated, with less pain than after the previous examination.

21st. A weak solution of nitrate of silver was applied to the ulcerated points, and repeated on the 24th and 28th inst. The patient complained a great deal of pain after each application, but the surface gradually healed. She remained in the hospital during the summer, without further treatment than the injection of water into the bladder. In December the fistula was closed, but on removing the sutures the edges separated immediately, no union having taken place in consequence of the cicatricial character of the edges, resulting from the frequent use of the nitrate of silver. As her general health was still poor, the fistula was not again closed until May 31, 1870. The vaginal tissue around the edges of the opening were freely removed with a pair of scissors, and the surfaces secured by seven sutures. June 9, the sutures were removed, and the edges found firmly united. She was discharged cured July 18, 1870, having been two years and some eight months under daily observation and treatment. After her discharge her general health improved, and she had no further trouble with her bladder. She continued to improve, and was in good health when she returned to her friends in Ireland two years later.

By so full a history, as of the two cases just given, a general idea of the treatment can be obtained, and the reader would gain scarcely more knowledge, were a number of other cases added. But in regard to the condition of the kidneys, the following case, and one to be given when treating of laceration of the urethra, will elucidate the post-mortem appearance, when death occurred after the administration of ether.

CASE LIV.—Mrs. S. admitted to the Woman's Hospital June 22, 1868, aged 39. Had married at 21. Sterile. Shortly after marriage had an attack of cellulitis from putting her feet in cold water to check her period. Four years after first attack, had a recurrence which terminated in pelvic abscess, which after several months opened into the vagina. About 15 months previous to admission the urine began to escape into the vagina, with partial relief to the cystitis afterwards. June 23, ether was administered for the purpose of enlarging the sinus to admit of the free escape of urine from the bladder. Through the vagina could be felt the remains of an old abscess, running from the left broad ligament down between the uterus and the bladder. The bladder was also felt contracted and hard. She was placed on the left side, and Sims's speculum introduced. The mouth of the sinus leading into the uterus was found in front of the uterus. The opening was of a sufficient size to admit a large-sized sound into the bladder, but did not allow of a free escape of urine. A certain quantity would collect, and then escape all at once as if driven out by contraction of the bladder. The general condition was very poor, but with the hope of relieving the irritation of the bladder, and there being no prospect of relief otherwise, the opening was enlarged about half an inch. This was just sufficient to admit the finger into the bladder, which was found contracted and thickened, and having lost a large portion of its mucous membrane from ulceration. Death resulted from uræmia, forty-eight hours after the operation. At the post-mortem examination, it was found that for a long time she had suffered from tubercular peritonitis. The sac of the old abscess was found as described. The left kidney was enlarged and dilated. The cortical portion was nearly gone, and the tissues apparently in a state of fatty degeneration.

The pelvis of the kidney was dilated enough to contain some three ounces of fluid, and the ureter large enough to admit two fingers. The right kidney was destroyed, and had done no work for years. It was enlarged, but nothing was left but the capsule containing half a pint or more of a deposit having the appearance and consistency of white lead. The liver was enlarged and fatty, and there was an abnormal amount of fluid in the pericardium.

Dr. Francis Delafield made a microscopic examination of the two kidneys. The right one was the seat of very extensive tubercular deposit, the tubercles having undergone cheesy degeneration. Scarcely a trace of the kidney structure remained. The pelvis of the other kidney was dilated. The epithelium of the calyces and convoluted tubes were in a state of fatty degeneration, and some of the Malpighian bodies were contracted and hard.

Stone in the Bladder and Ureters.—It is a common belief that residence in a limestone country, favors the development of stone in the bladder.

Under all circumstances, however, the formation of stone in the bladder of the female is less frequent than in the male. This is due to the fact that the female urethra is short, and of large calibre, and facilitates the easy passage of sabulous particles.

In this portion of the United States, stone is exceedingly rare except as an accompaniment of cystitis; or after an operation for closing a vesico-vaginal fistula; or as a consequence of the introduction of some foreign body into the bladder, by the woman herself.

The character of the stone is therefore almost always phosphatic, being the result of some irritating cause, while the uric acid formation so commonly found in the male, and depending on a constitutional condition, are rarely met with among women. It is likely that the uric acid deposit is as frequent with women as with the men, but it is washed out before it has time to effect a lodgment. The development of phosphatic calculi, however, is rapid, as the phosphates readily precipitate upon any foreign body that may be present, forming incrustations which are not easily dislodged.

I have seen two instances of stone in the bladder due to spinal injury resulting in loss of motion and sensation.

In 1868 I was consulted in the case of a lady from Norfolk, Va., who was suffering with paralysis of the lower limbs, from a fall. Four months after the fall urine began to escape by the vagina, and in a few days a sufficient number of calculi were passed to fill a large-sized tumbler. I found on examination that the whole base of the bladder had been lost, as well as the urethra and the sub-pubic tissue up to the periosteum; the vagina was almost occluded. The urine had been allowed to accumulate in the bladder after the injury, as she had doubtless lost all sensation in the parts, and the bladder was afterwards never thoroughly emptied. The urine becoming highly phosphatic gave rise to the formation of calculi, which, by the pressure upon the vesico-vaginal septum, produced a slough on account of the impaired vitality of the parts. No attempt was made for her relief, as the paralysis had not yet disappeared, and even had it been possible to close the opening, doubtless sloughing would have again followed in a few weeks. I was never able to learn her subsequent history.

The other patient gradually recovered sensation and motion, and the stone was recognized and removed.

In cystitis calculi frequently form in some pouch where the urine is being retained until it becomes decomposed and phosphatic.

In the greater proportion of the cases which have passed under my observation the calculi have formed within one or two years after a vesico-vaginal fistula had been closed, and generally when the operation had not been performed by myself. The formation has more frequently followed some operation about the neck of the uterus, and generally when laceration had occurred through the anterior lip into the base of the bladder. I have in several instances found the nucleus to be a small portion of wire which had dropped into the bladder as the end of some suture had been clipped. But as a rule I believe the nucleus is furnished by some denuded surface which had been turned into the bladder, or left there through a careless adjusting of the edges of the fistula. Dr. Henry F. Campbell, of Augusta, Ga., has offered a different explanation of the origin of calculi after the operation for vesico-vaginal fistula:[1] "Reasoning, then, from my own case, and from others in which calculi of considerable size have been found to exist in the bladder shortly after closing of fistulæ by operation I conclude, 1st, that in such cases the stone exists previous to the fistula, perhaps *causing* the slough during the labor in which it occurs; 2d, that, like the present stone, they are grasped by the empty bladder, and remain imbedded during the entire period of the existence of the fistula; and, 3d, that when the fistula had been closed by operation, and the collection of urine in the bladder becomes again possible, the consequent distension releases the stone; the calculus is not, therefore, in process of formation in the bladder at that time, but is only *discovered* after the case of the fistula."

This explanation is original, and I have no doubt is a correct one for a large number of cases. I can recall several instances in my own experience where I was unable to offer to myself any explanation for so rapid a development of stone within a few weeks after closing the fistula. But, on the other hand, I have known of several cases where the loss of tissue had been too great, and too large a portion of the bladder had been constantly inverted for a stone to have had any lodgment. I acknowledge the importance of Dr. Campbell's explanation, and the consequent necessity for passing the finger into the interior of every bladder before closing it. But I am equally certain that an undenuded surface left in the bladder will furnish a starting-point, and a stone may be developed within a short time after closing the fistula.

The symptoms of stone resemble closely those of cystitis, and, unless a steel sound be passed into the bladder, the differentiation will not be easy. This is best done while the patient lies on the back, with her limbs flexed on the abdomen, and held by an assistant on each side. The administration of ether is generally necessary, and it is well to moderately distend the bladder with tepid water before attempting the examination.

There are two methods by which a stone may be removed from the bladder: through the urethra or through an opening made in the base of the bladder from the vagina. The removal by the urethra is the oldest method. When the stone is soft and of a moderate size it may be readily crushed by a lithotrite, and, if it be thoroughly broken up, the débris will rapidly pass through the urethra. As a woman, in comparison with a man, is little liable to inflammation, the stone should be repeatedly and thoroughly crushed, and it should all be accomplished at a single sitting. But this should not be undertaken unless the operator has acquired a reasonable amount of dexterity. The chief danger is in wounding or lacerating the lining membrane and neck of the bladder. The first can be avoided, but the second cannot always be guarded against, and is really the chief danger and objection in this mode of operating. The bladder should be filled with water, and on picking up the stone the precaution should always be taken to turn the instrument to one side and then to the other and gently draw it forward, that we may be certain that no portion of the viscus is included within the grasp of the instrument.

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[1] Origin and History of Calculi found in the Bladder, after the Cure of Vesico-Vaginal Fistula by Operation. American Gynecological Transactions, vol. i. 1876.

After the stone has been broken up it is of the greatest importance to remove the fragments as soon as possible, since the presence of these, it is now well recognized, will usually cause more irritation than is likely to result from any ordinary amount of manipulation. By injecting a quantity of water, through a large-sized double catheter, the débris can generally be washed out, but the procedure is not always satisfactory, and I have preferred to remove the stone entire through an incision from the vagina.

Dr. Henry J. Bigelow,[1] of Boston, has devised an excellent method for crushing a stone in the male bladder, and for removing the fragments, which it appears is even yet more applicable in the female. His evacuating apparatus consists of an elastic bulb, with a glass tube attached for receiving the fragments of stone. The bulb communicates by means of rubber tubing with the canula, which is introduced into the bladder. It requires some little skill to carry the fenestra of the instrument to the most dependent points, and to keep it free from being stopped up by the walls of the bladder. The bulb is first filled with tepid water, and then emptied into the bladder by compressing it slowly. It is next allowed to expand, and, in doing so, the water returns into it from the bladder, bringing with it a greater or less quantity of the crushed fragments, which quickly subside into the glass tube, and are not thrown back into the bladder when the bulb is again compressed. Any larger pieces that remain must in turn be crushed, until all have been broken down to a size which will admit of their passage through the evacuating canula.

Dr. Bigelow's paper is of the utmost practical importance in re-

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[1] Lithotrity by a Single Operation. Am. Journ. of the Med. Sciences, Phila., Jan. 1878.

[illegible] the long-accepted doctrine that the crushing of stone with [illegible] process to be extended over an indefinite period. It is [illegible] that this method compares most favorably with the best [illegible] devised for removing stone.

When the walls of the bladder have become thickened, and marked [illegible], the proper course is to extract the stone through an [illegible] opening in the vesico-vaginal septum.

[illegible] this means, be safely removed by one who may not [illegible] the dexterity to crush it properly. It is the operation *par* [illegible] when the bladder has become so diseased that absolute rest [illegible] is to be obtained only by allowing the urine to [illegible] as it enters the bladder.

[illegible] whom we are indebted for this procedure, but the [illegible] the closure of vesico-vaginal fistulæ renders it practicable. The operation does not differ essentially from that described [illegible] cystitis by opening the base of the bladder.

After the stone has been removed the patient should be turned on [illegible] a bed-pan, the nozzle of the syringe introduced [illegible] the urethra, and the bladder thoroughly washed out, while [illegible] the fistula are kept apart by the index finger introduced [illegible] vagina. After removal of the stone, the opening thus made [illegible] in the same manner as for vesico-vaginal fistula generally, [illegible] closed immediately, unless the mucous membrane is [illegible] a diseased condition. In this event, the case must be [illegible] were one of cystitis, and the opening left for the free [illegible] until the parts, by rest, gradually recover their tone.

[illegible] *Stone from the Ureters.*—Calculi are frequently formed [illegible] of the kidneys, and, while yet small, pass through the [illegible] into the bladder, there to furnish nuclei for larger accretions, [illegible] escape by the urethra.

[illegible] with three instances where the stone had been unable [illegible] the bladder, and had remained at the mouth of the ureter, [illegible] valve. This condition leads to more or less dilatation [illegible] the ureter, and causes backache, irritability of the bladder, a [illegible] about the pelvis, and other symptoms, which, unfortunately, [illegible] pathognomonic of the condition. The symptoms [illegible] marked as to the existence of a stone in the bladder, [illegible] when one is not found. To add to the difficulty, [illegible] will sometimes pass over the stone, furnishing the [illegible], but after a number of careful examinations [illegible] any further information. In two instances I had detected the presence of stone, and had invited several gentlemen to witness me operate for its removal, but, to my mortification, the stone could not be felt again, and the operation was postponed. In one of these cases I afterwards opened the bladder, seeking for a solution of the mystery, and detected with my finger the stone in the mouth of the ureter. I then passed the instrument, which has been described as the curette forceps, alongside of my finger into the ureter, and withdrew the stone with comparatively little difficulty.

In a subsequent case having always felt the click of the steel sound at the same point, I was led to suspect that the stone was in the ureter, and by making slight backward pressure with a large sound in the bladder, I was able to feel it with my finger either in the vagina or rectum.

As the patient lay on the side, with a speculum introduced, I cut down on the stone with a pair of scissors while an assistant kept the parts prominent by pressing backward and upward with a sound in the bladder.

As soon as I reached the stone, I enlarged the opening forward, towards the neck of the bladder, this being the only safe direction to avoid entering the peritoneal cavity. After considerable difficulty I succeeded in getting hold of the stone, and in withdrawing it without having entered the bladder or peritoneal cavity.

This stone is in the collection of Dr. Edward L. Keyes of this city who has furnished me with the following description. "The general shape and size is like a portion of the little finger, the surface being smoothly bossed. Its long diameter measured 1⅛ inch, after a small portion had been broken off and lost; the short diameter ½ inch. The greatest circumference 4⅝ inches; the lesser one 1½ inch. The weight was 98 grains, twelve years after its removal. Its composition was mainly carbonate, with some phosphate of lime, a trace of amorphous urate, and a little organic matter."

I closed the opening with interrupted sutures, and was particularly careful to see that their points of exit and entrance were along the external surface of the ureter, so that the line approximated with the greatest accuracy. The case made a good recovery.

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which some authors have given of acute ovaritis; considerable increase in the size of the organ, notable hyperæmia, traces of effusion in the vesicles, purulent foci in the parenchyma, and fibrinous exudation under the peritoneal envelope of the organ. After what precedes, it may be seen that in this case we had a combination of the three forms of ovaritis, which confirms our assertion on the subject of the rarity of its existence in an isolated form."

As rare as ovaritis is in the non-puerperal state, the opportunity is afforded still less seldom to study its post-mortem appearances. When the whole ovary becomes enveloped in a mass of lymph, as in this case, the vesicles themselves must become inflamed, since they are unable to discharge their contents. We have here, doubtless, a clue to the cause of many cases of sterility, because such a condition must prevent the escape of the ova from the Graafian vesicles, and induce atrophy of the ovary. The severe character of the pain so commonly experienced may be due to pressure, as in the case of hematocele, where the limited space, which has been completely closed in by the inflammatory process, becomes distended by continued effusion of blood.

The ovaries are supplied with nerves from the renal plexus, but so scantily that in the absence of inflammation, a doubt may arise as to the pain which is so frequently experienced in their neighborhood being due to "ovarian irritation," or whether even it has any direct connection with the ovaries. A woman seldom suffers from "ovarian neuralgia" without at the same time giving evidence of uterine disease, but it is not always easy to place these two phenomena in their proper relation of cause and effect. We may often be able to attribute the diseased condition in both organs to a common cause, extrinsic to both. Any obstruction to the circulation in the pelvic connective tissue, if due to nothing more than a general lack of tone, tends to increase the venous circulation in both ovary and uterus. The remains of an old cellulitis have the same effect, and may so obstruct the circulation as to establish an erosion on the cervix, the result of nature's efforts to relieve the congestion by an increase of secretion.

Much damage is done at times by inflammation due to childbirth, the subsequent contraction and pressure producing disturbance of the nervous system, and of menstruation, and even sterility. But we possess no positive means of recognizing these pathological changes during life, or, if recognizing them, to remedy the difficulty. It is of no practical value to make a distinction as to any special form of oöphoritis, and the fact already stated, may be remembered that the

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have attended, in comparative health, to their domestic duties." I have seen but one instance of this kind.

CASE LV.—Feb. 13, 1872, Mrs. D., aged 48, came under my care, after a consultation with Dr. Noyes, who had been treating her for eye trouble, and had suspected a possible reflex irritation from some uterine disease. She gave the following history: Menstruation appeared for the first time at 15; she became regular at once, the flow lasting a week without pain, and she was in excellent health when married at 20 years of age. She gave birth to six children, at full term, by natural labor, and had miscarried twice. The last child was then eight years old, and the last pregnancy terminated in miscarriage, at four months, about five years previous to consulting me. She stated that it had been necessary to employ instruments to remove the fœtus, and she suffered from hemorrhage. She had a long convalescence, and never afterwards entirely regained her previous good health. Menstruation after this miscarriage became more free, lasting from ten to twelve days, frequently amounting in quantity to a hemorrhage, and often returning in the intervals between the periods. She had gradually become weaker, and unable to exercise or stand for any length of time without aggravating a pain on the left side, from which she was seldom free.

The uterus was four inches deep, and anteverted. A number of granulations in the uterine canal could be felt with the probe, and on withdrawing the instrument the discharge of blood was quite free. An unusually deep fissure existed through the posterior lip, which had extended partially into the bottom of Douglas's cul-de-sac, and healed, but yet remained patulous enough to allow a finger to be introduced nearly to the internal os. A mass, about the size of a large hen's egg, was felt on the left side. This could not be well defined from the vagina, but as felt from the rectum it was found to be uniform in shape, and was supposed to have been the remains of an old cellulitis involving the ovary. She was very anæmic, and a functional murmur was audible over the region of the heart, and the vessels of the neck.

Feb. 16. She entered my private hospital, flowing very freely. She was kept in bed, and an application of impure carbolic acid was made to the fundus daily by means of the application, followed by a vaginal tampon. By Feb. 21st, the hemorrhage was arrested.

23*d*. A sponge tent was introduced, which dilated the canal fully, and after removing a large quantity of granulations, with the proper forceps, I applied equal parts of carbolic acid and glycerine freely throughout the canal. This had the effect of arresting the flow of blood for a month. At the end of that time, however, there came on a watery discharge, which it was thought advisable to stop, if possible, on account of the extremely anæmic condition of the patient.

March 25. The canal was again partially dilated, to facilitate the application of the carbolic acid. She had no further local treatment, and suffered no inconvenience afterwards, and there was a decided improvement in both her appearance and strength. This was her condition on retiring to bed.

30*th*. The weather was mild, and the temperature of her room during the night was too warm, so that she was quite restless. While half awake she suddenly turned in bed, when she felt "something move inside of her." She became nauseated, and vomited; the prostration was so marked that I was called up to see her, and found her in collapse. In a few hours she reacted: a violent chill then occurred, followed by fever, and her pulse increased to 130 per minute. During the day her fever continued, but she was relieved of pain in the abdomen by the use of opium and hot applications. On the following day, April 1st, during the forenoon, she had another chill, but it was not as violent as the previous one. At 4 P.M., her pulse being 120, the skin began to be moist, and she exhibited other indications of blood poisoning. Ten grains of quinine were given at 9 P.M.; this dose was repeated at 12 P.M., her pulse having then fallen to 110; the same quantity was administered at 3 A.M.

April 2. 9 A.M. The quinine was not given as the stomach was irritable. The pulse had fallen to 106, but as its character was indicative of a loss of power, she was ordered iced champagne. Dr. T. G. Thomas saw the case in consultation at half-past ten A.M. The temperature of the body was then 105°, and a jaundiced tint of the skin was noticed for the first time. There had been three slight movements from the bowels since my last visit, which were attributed to the peritonitis. The condition of the stomach, however, had greatly improved. It was decided to return to the quinine in doses of three grains, every six hours. She was to take five drops of nitro-muriatic acid, every three hours, and milk punch in such quantities as she could bear, and at such intervals as seemed to be indicated. A vaginal examination was made, but nothing ascertained beyond the existence of an extensive cellulitis on the left side. The pulse gradually diminished in frequency, and the condition of the skin was remarkable, for while the temperature in the axilla or vagina was from 104° to 105°, the sense of touch could detect no unusual elevation on the general surface. She was sweating moderately all the time from blood poisoning, but where the body was not covered, the temperature on the surface was lowered by evaporation. Without the use of the thermometer we should have had no knowledge of her critical condition, for she no longer suffered from pain, and had been without opium for nearly twenty-four hours.

3*d*. The general condition had improved, the temperature had fallen to 103°, the pulse to 90; the yellow tinge in the skin had become less marked; there was no longer nausea, and her nourishment was all retained, when administered by either the stomach or rectum. Her condition seemed so favorable, that Dr. Thomas considered it unnecessary that we should meet for another consultation. Throughout the following day, April 4, there was no apparent change, with the exception that her strength was evidently not so good, and at times it seemed that her mind wandered, although she was perfectly rational when spoken to. About half-past one A.M., April 5, she sank into a collapse as suddenly as at the beginning, but did not react, and died at six o'clock A.M.

Five hours after death the autopsy was made, and by request it was confined to the abdominal cavity. General peritonitis existed, and, in the pelvis, on the right side, and around the intestines, was found a quantity of free pus. It was evident that the ovary had long been the seat of an abscess, which had gradually destroyed the whole organ, so that nothing remained of it but a sac. Nature had attempted a repair by encysting the sac, so that in all probability the contents of the abscess would have escaped into the rectum at some future time, if the rupture into the peritoneal cavity had not been caused by the sudden effort of turning in bed. Notwithstanding the symptoms of blood-poisoning, which were evident, she had begun to improve. As ample adhesions had taken place, the newly-formed pelvic abscess would eventually have opened into the rectum or vagina, and so she might have recovered, but the second unfortunate rupture of the sac into the peritoneum induced a shock from which she had not the strength to rally.

Enlargement of the Ovary.—In chronic inflammation of the ovary the organ is generally enlarged, and when free from adhesion it prolapses, more or less, from the increased weight. It may occupy any point between its natural position and the bottom of Douglas's cul-de-sac, so long as it does not exceed twice its natural size. Where it has become hypertrophied to a greater degree, which is very unusual, it cannot reach so low a position in the pelvis, and will be the more likely to form adhesions. As with an inflamed testicle, the slightest pressure upon such an ovary will produce pain, and frequently nausea. The uterus is also enlarged, the cervix the seat of an erosion, and the organ itself is generally retroverted when the ovary is prolapsed.

A movement of the bowels will, for a time, increase the suffering in consequence of the relation of the rectum to the left ovary, this being the one which is usually affected. There will be an inability, on the part of the patient, to exercise or to stand for any length of time without adding to the feeling of discomfort.

There will be dysmenorrhœa, with the menstrual flow irregular both in duration and quantity. The surface of the ovary is usually smooth, while its texture is soft and boggy when the disease has not been of long duration. This condition frequently makes its appearance early in menstrual life, and if not relieved will in time be complicated by attacks of local peritonitis, or cellulitis. Ultimately the size of the ovary becomes greatly reduced and its surface roughened or corrugated. Menstruation, which may have been previously too free, will now become scanty and irregular. A woman subjected to either stage of this disease will seldom, if ever, be entirely free from pain at any time throughout the menstrual month. But at the time of the flow all the symptoms will be greatly aggravated; so much so that the existence of active inflammation will seem to be indicated by the occurrence of a chill, the increase of pulse, the pain, and pyrexia.

Under other circumstances there will be no prolapse of the ovary, or even an appreciable enlargement, for the organ will remain beyond the reach of the finger. Yet the same disturbance of the nervous system will exist, menstruation will be as irregular, while the constant pain in the neighborhood of the ovaries and every other symptom will indicate that the same state of disease or irritation has been established in both conditions.

With all these various diseases the general health is greatly impaired, and, as a rule, a profound degree of anæmia exists.

Dr. [illegible] states:* "We can hardly conceive an inflammation of an organ, which recurs every month throughout thirty years, and which is nevertheless compatible with the continuance of the ovarian function. These symptoms, then, which, outside the menstrual epoch, would be considered to indicate inflammation of the ovary, may be regarded as temporary hyperæmia and hyperæsthesia of the organ."

These views express very perfectly my own convictions. Often [illegible] to indicate a local disease, there will be no dis[illegible] or of any [illegible]ance, some morbid change be[illegible] effect of disease elsewhere.

[illegible] ovarian disorders are but an evidence that [illegible] and that the nervous system [illegible]

[illegible] condition which has been termed an [illegible] has had her brain developed [illegible] or crossed in love by some [illegible] have been ill mated, and, often, [illegible] person, under the guise of mar[illegible] prostitute, and she who degrades [illegible] by resorting to means to prevent conception [illegible] the nervous system has been first [illegible] suffered, some accident only locating the effects in the ovary.

We are unable [illegible] the fact that the extent of disease may be limited to what may be termed a congestive enlargement, due to obstruction in the venous circulation. The enlargement is evidently not from arterial congestion, for that would tend to inflammation, which, if continued, leads to the breaking down of tissue, and the formation of abscess. This venous congestion may last for years, and from some unknown cause the ovary may be prolapsed, but only as an exception to the rule, for an ovary equally large and as free from adhesions will more frequently remain in place. Under this congestive influence the organ undergoes cystic degeneration, and remains stationary at nearly the same degree of enlargement for years. A rarer change is an early atrophy which presents the appearance of cirrhosis, but this has been already referred to.

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* Diseases of Women, American edition, p. 262.

Ovulation in an ovary in either of these conditions is generally imperfect, and is attended with dysmenorrhœa and other menstrual disorders.

Treatment.—It is difficult to afford any marked relief during the menstrual life of the woman. Within the whole range of the disorders to which women are liable, none, as a rule, present so unpromising an outlook as this, for both patient and physician.

A serious state of anæmia exists in all these cases, and the condition has already long reached a stage when it would be of little importance to determine what is the cause and what the effect. The close relation existing, through the sympathetic system, between the generative function and general nutrition has already been treated of. During the menstrual life of a woman, the dominant power is the influence emitted from the ovaries, and when normally exercised is a most potent stimulus to healthy nutrition. It can then be readily understood that to correct this extreme state of anæmia, while ovulation itself is so imperfect, must be difficult. After the menopause, however, the sympathetic nerves again become dormant, in their relation to sexual functions, as before puberty, and an attempt is at once made to correct and repair the defects in nutrition.

There are many cases where, by judicious treatment at an early stage, health can be regained. In other instances, I have known the reparative powers of nature to prevail, after every artificial means had been resorted to, and the cases regarded as hopeless. We should then never despair in any case. But the prognosis often turns on the degree of judgment with which the case has been treated by the physician in charge of it at the beginning. Many a woman has been rendered incurable in consequence of the opium habit, contracted at the instigation of an ignorant or careless medical adviser. Of all drugs, none is more potent than morphine in producing anæmia, and in causing by long use a neuralgia from its own poisonous effects. I have seen several instances of so-called oöphoritis, in which morphine had been freely used for years to relieve pain over the region of the ovaries, and in which, under more judicious management, an improvement in the general health took place, and all pain disappeared in two or three months after the opium habit had been broken up. I have no doubt that there are cases of local neurosis due to pressure exerted by the contraction of ovarian tissue. In these cases the pain not only continues, but will become worse, if the use of anodynes be discontinued. But in the beginning, the ill-judged use of opium, doubtless aids in producing an anæmia which would otherwise not occur; and it may even induce inflammation of the ovarian tissue, through its deleterious influence on nutrition. After a certain stage has been reached in the use of morphine, but few victims will have the courage to make a real effort to get rid of the evil; in fact, the chances for reform from the opium habit are less promising than those for a full restoration of the lowest drunkard from the gutter. But the attempt at reform must be the first step, and the habit must be broken up if possible, for as long as it exists no accurate idea can be formed of the local condition.

To direct any special course of treatment is impossible, since every function of the body will be impaired to a greater or less degree. The one great aim should be to lessen, if possible, the anæmia. Drugs will be of little service at first, but we may accomplish much by sunlight and fresh air. Whenever the circumstances will admit of it, the patient should expose her whole body to the sunlight, so as to secure its active effect on the blood in the capillaries, and the longer the better. Should she be too feeble to get about, she must be carried into the open air in favorable weather, to remain from morning until night. Hot water vaginal injections must be given night and morning, and such other appropriate measures instituted as have been fully detailed under the head of general principles. A change to a milder climate in the winter will aid greatly in removing the state of anæmia. Yet, after all, we will meet with a certain number of cases where every measure will fail, and the irritation will become gradually concentrated in the disturbance of the healthy action of some nerve centre. We may then have epilepsy, or even insanity as a consequence, and for the relief of which no rule can be laid down.

Battey's Operation.—Dr. Robert Battey, of Georgia, in 1872, reported[1] a case of extirpation of the ovaries, and recommended the operation for the relief of cases of imperfect ovulation marked by an "excessive menstrual molimen." The operation was termed "Normal Ovariotomy," and was only to be resorted to after all other means of cure had failed. The source of irritation, it was conceived, would be removed by the cessation of ovulation, brought about by the extirpation. His views have been imperfectly understood, and as the success has not exceeded some twenty-five per cent., and as there has been a considerable mortality attending it, the operation has not yet been accepted by the profession.

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[1] Atlanta Medical and Surgical Journal.

In a recent paper,[1] Dr. Battey states: "In doing these operations I have sought to effect a cure of the varied maladies complained of, by the removal, in certain instances, of an ovary viciously or abnormally performing its functions, and more frequently by the removal of both ovaries, to put an end to ovulation entirely, and thus to determine the menopause, or change of life; whereby I have hoped, through the intervention of the great nervous revolution which ordinarily accompanies the climacteric, to uproot and remove serious sexual disorders, and re-establish the general health." The operation was supposed by many to have been also recommended for the relief of nymphomania. This has been distinctly stated as not being correct, since "there is no reason to expect its cure by the arrest of ovulation."

The operation was performed, in most of the cases, with the patient on the left side, and by the aid of Sims's speculum. The cervix was drawn down to the pubes by means of a strong hook, where it was held while Douglas's cul-de sac was opened from the vagina by means of a pair of scissors. On reaching the ovary, with the finger as a guide, it was seized by forceps or tenaculum, and drawn out into the vagina. It was then separated by the écraseur, or, being secured by a silk ligature, it was cut off, and the stump returned into the cavity, the opening being left to close gradually, so as to admit of drainage.

The position of the patient causes the intestines to gravitate so that they are out of the way during the operation. The cul-de-sac is, however, generally empty, under ordinary circumstances, and after the operation the presence of the stump and rapid adhesions prevent a prolapse of the intestines into the vagina. The operation can be readily done in this position, so long as the ovary happens to be free from adhesions. When adhesions exist the ovary is to be removed

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[1] Transactions of the American Gynecological Society, vol. i. p. 102.

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[illegible] M. D., British Medi

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tion has been limited to one by Dr. Thomas, where, although both ovaries were removed, the woman was only temporarily benefited, and one by Dr. Peaslee which resulted in death. I agree with Dr. Sims as to the necessity of removing both ovaries if the operation is called for, since it is evident from the records before us that a favorable result is not to be expected unless cessation of ovulation is accomplished. Until the proportion of deaths is much lower, and that of benefit increased, the class of cases must remain a very limited one in which a resort to this hazardous operation would be justifiable. Future observation must also demonstrate that the result of producing an artificial change of life has a beneficial effect on the nervous system.

With my present knowledge of the yet unsatisfactory results, my consent to the operation would be limited to cases of threatened insanity, epilepsy, or phthisis. For nervous disturbances which present more of the hysterical element, the operation should never be thought of. In many such apparently desperate cases I have seen a little moral suasion, administered with firmness, accomplish a great deal, and nature will often, when aided, bring about a favorable change in nutrition when least expected. The operation may be more frequently necessary in the present generation than it ought to be in the future, since a large number of cases calling for it have, under injudicious management, been already rendered incurable by other means. But I hold that in the future this ought not to be so, for our enlarged opportunity for acquiring wisdom in the treatment of uterine and ovarian diseases should enable us to raise our patients above the necessity for such a terrible ordeal.

CHAPTER XXXVII.

TUMORS OF THE OVARY.

Solid (fibrous) tumors—Cystic tumors: follicular cysts; compound cystomata; myxoid and dermoid cystomata; cystoma proliferum papillare; C. parviloculare; C. sarcomatosum (cystosarcoma); C. myxomatosum—Retrograde metamorphosis of cystomata: fatty, sclerotic, atrophic, hemorrhagic, purulent, spontaneous perforation—Development of cystomata.

THESE may be divided into solid and cystic tumors. The solid tumors may be subdivided into fibrous, cancerous, and sarcomatous; and the cystic tumors into follicular cysts, dermoid cysts, and ovarian cystomata.

Solid tumors.—These are exceedingly rare, slow of growth, and seldom reach a large size.

Fibrous tumors of the ovary, unlike those in uterine tissue, involve the whole gland; they frequently undergo partial degeneration into bony and sometimes cartilaginous structures. It is often difficult to make a diagnosis between fibrous ovarian tumor and pedunculated fibrous tumor of the uterus, and the former can be distinguished from a cystic tumor of the ovary only by the difference in density.

A woman with a fibrous tumor of the ovary may suffer a certain amount of disturbance from pressure, but as the growth is slow, and seldom reaches any magnitude, there will be little call for interference. Sometimes, however, its removal may be necessary, as local peritonitis may follow and cause ascites, and the tumor may attain such a size and weight as to demand removal.

The operation for the removal of an ovarian fibrous tumor must necessarily be the same in principle as that to be described hereafter under the head of ovariotomy.

I have met with several supposed fibrous tumors of the ovary, but they were all too small to call for any interference. The only cases on record in this country, where the fibrous tumor had reached a size making its removal necessary, were two operated on by Dr. Wm. H. Van Buren of this city, one in 1849, and the other in 1850. Dr. Peaslee, in his work on Ovarian Tumors, gives Dr. T. G. Thomas the credit of having also removed such a tumor, but Dr. Thomas[1] regards the case as having been one of "true cysto-fibroma." I removed an apparently solid tumor as large as an adult's head in May, 1876, from a patient in Brooklyn, under the care of Dr. Joseph C. Hutchison, which was supposed to have been a fibrous tumor of the ovary, by Dr. Peaslee and myself, who had watched the case together for five or six years. But on examination under the microscope, it proved to be a myo-adeno-cystoma, or a granular cyst tumor of the ovary, containing muscular fibres. This case is referred to for the purpose of showing the difficulty of diagnosis, and, it may be added, to illustrate how doubtful is the diagnosis of all fibrous tumors of the ovary which have attained a large size.

Schroeder[2] states that "it is still doubtful whether only true fibromata occur in the ovary, or myo-fibromata also, since it is extremely difficult to decide even in the cadaver, whether the fibroid has originated from the uterus or the ovary." Again, "It is, therefore, still a matter of doubt whether the true myo-fibromata do not always arise from the uterus, the true fibromata alone being of ovarian origin. Virchow considers that myo-fibromata occur in the ovary, but that the smooth muscular fibres are only sparsely found in them."

Some writers regard these tumors of the ovary as being malignant in character, especially when accompanied by ascites, but I question the fact, since I have not had such a case under observation for many years.

It might be very difficult to form a diagnosis between an ovarian fibroid and cancer of this organ, especially if there should be any fluid in the abdominal cavity. We should, however, expect a fibroid to be more movable than an ovary which had undergone cancerous infiltration, since the latter process, by exciting irritation, must give rise to adhesions. It is also stated by observers that a fibroid retains more the shape of the organ, while in cancer of the ovary the surrounding tissues become so involved, that the mass is soon broader and thinner than with a fibroid. Moreover, cancer is rarely if ever confined to one ovary.

Instances of scirrhus and sarcoma of the ovary have been met with, of great interest to the pathologist doubtless, but of little practical import, since, however great the necessity, we lack the means to differentiate during life between the several forms of malignant disease.

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[1] Thomas on Diseases of Women, p. 655, 4th edition.

[2] Ziemssen's Cyclopædia, vol. x. p. 437. N. Y. edition.

I have never met with an instance of any form of malignant disease which was confined to the ovary. In fact, when the ovaries are involved, it is, as it were, the last stage of some contiguous disease in which the rest of the pelvic tissues will have already become involved.

CYSTIC TUMORS OF THE OVARY.

Follicular cysts are the most common, and at the same time the least important of the cystic growths connected with the ovary. They rarely ever reach a size to produce inconvenience, or to be recognized during life. According to Schroeder,[1] "the dropsy of the Graafian follicle represents a so-called [illegible]-cyst, and is to be considered in the same group with tubal dropsy, hæmatometra, etc." "They occur singly, or the whole ovary becomes, through a repetition of the same process in numerous Graafian follicles, converted into a tolerably large tumor, which presents or assumes a multilocular cystic appearance." ([illegible].) These cysts have a smooth wall, no projecting [illegible], and [illegible] contents consist of a clear, transparent serum. The origin of [illegible] owing to the causes which hinder the [illegible] of the [illegible]. Sometimes when a follicle is physiologically [illegible] either because the ovum has [illegible] ovary, or because the [illegible] the product of some [illegible] taking place. In [illegible] but the secretion [illegible] of a cyst. It is, more- [illegible] *Med. Z.*, 1859, No. 34, [illegible] for a cyst to form from a [illegible] from a corpus luteum, [illegible] opening where the rup- [illegible] corpus luteum, the [illegible] such case, in which [illegible] ovary of a patient who [illegible] a miscarriage. Next to the wall of [illegible] corpus luteum, and then the [illegible]

[illegible].—But little exact knowledge has yet been [illegible] in regard to the cause or origin of these growths.

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[1] Ziemssen's Cyclopædia, Am. ed., vol. x. p. 362.

No author, from his own observation, has heretofore described their condition with so much clearness as Waldeyer.[1]

Schroeder (*Ziemssen's Cyclopædia*) has briefly given these views, but in no other form, to my knowledge, have they reached the English reader. I regard the subject, as presented by Waldeyer, to be of sufficient importance to give his views at greater length than has been done, and, while they will not be quoted literally, the remainder of the chapter will be devoted to presenting them in substance.

Waldeyer, who designates the compound cystic growths of the ovary as "Cystomata," subdivides these tumors into two essentially different groups, viz.:—

(*a*) *Myxoid Cystomata*, of which the inner surface exhibits quite the appearance and behavior of an ordinary mucous membrane abundantly provided with glands and vessels, and

(*b*) *Dermoid Cystomata*, of which the inner surface shows the character of an external skin invested with epidermis.

The Myxoid Cystomata usually form large unilocular or multilocular sacs, of the size of a man's head and larger, so that they may contain as much as fifty to a hundred quarts (litres) of fluid. They may appear on one side or on both sides. The pedicle of these tumors is formed by the ligamentum ovarii, the tube, and the ligamentum latum, the latter containing numerous vessels, often very large. The longer and thinner the pedicle, the firmer is it apt to be, and it contains pre-eminently fibrillary connective tissue, and a few smooth muscular fibres. In rare cases the pedicle is entirely wanting, and the ovarian tumor sits immediately on the uterus with a broad base. The components of the cystomata are the main cystic walls, the secondary cysts, the proliferations of the inner and external surface, and the cystic contents, generally fluid.

The main cystic wall, inclosing all the other structures, forms the external boundary of the tumor, and usually incloses also a main cystic space which has always been formed, perhaps, by a confluence of several smaller primary cysts. Into this main cyst project almost all the secondary cysts, and from its wall stand most of the glandular and papillary vegetations, and it also conceals the principal mass of the contents. The older the cystoma, the larger in general becomes the principal cystic space, and finally the cystoma becomes unilocular, all the secondary cysts being blended with the chief cyst. In the smaller or younger cystomata, it is true, a principal cystic space cannot be discriminated, and they form rather solid walls, on the section of which we find numerous small cysts with gelatinous contents. The blending process of the secondary cysts, with the principal cyst, is first of all introduced by a thinning of the walls of the secondary cysts, incident to their growth. Later a perforation takes place into the principal cyst, or into a neighboring secondary cyst, after which the perforated cyst ceases to grow, and atrophies. The opening that has originated becomes larger and larger, and the space within the opened cyst becomes flatter and flatter, until at last only a flat dish-shaped depression remains in the wall of the principal cyst. The formations appearing by further development on the inner surface of the principal cystic wall are, in a certain series of cases, pre-eminently of a glandular nature, and in the sections through the cystic wall everywhere show small, single, tubular epithelial recesses, and in this way the *cystoma proliferum glandulare* originates. The openings of these tubules are soon obliterated by the tenacious secretion, and thus dilatations originate that are transformed into just so many small cysts, like retention-cysts. New glandular formations soon proliferate from the inner surface of these small cysts, and this process advances in continuing succession, so that these small cysts are ranged, story upon story, as it were, and generate forms that have the greatest similarity with a honey-comb.

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[1] See Archiv für Gynækologie. Erster Band, Zweite Heft, s. 252.

In other cases numerous villous and dendritic vegetations, varying in size, sprout from the inner surface of the principal cystic wall. In some cases these growths are limited to a small space, only proliferating in places here and there, but in others they multiply to an incredible degree, filling up the entire cystic sac, thus constituting the *cystoma proliferum papillare*. They are generally very vascular, and their basis consists of the connective tissue of the inner layer of the cystic wall well supplied with cells. In form they are sometimes as fine slender filaments, or short ones, again as broad or high masses, ramifying as compound papillæ. At times these vegetations perforate the principal cystic wall, and proliferate in the abdominal cavity. Waldeyer explains the fact that adhesions of these cystomata with the neighboring parts are so rare by the peculiar nature of the ovarian epithelium. This consists of cylindrical cells, which bestow upon the surface of the cystoma the character of a mucous membrane, and, therefore, prevent adhesions forming so long as the entire surface of the tumor remains intact. But after the epithelium has been lost, which generally occurs in the larger cystomata as the result of friction against the abdominal walls, inflammation is excited, and adhesions take place generally to the abdominal walls, the omentum, and the uterus, but rarely to the intestines, which are so constantly in motion.

The principal cystic walls, and the walls of the somewhat larger secondary cysts, consist of two layers, an external connective tissue stratum, rather dense, of parallel fibres, and a much thinner inner stratum, very well provided with cells and vessels, on which the epithelium immediately sits. The smaller cysts are only surrounded by the last-mentioned stratum. Waldeyer maintains that the epithelium is always a cylindrical one, and covers the inner surface of the cyst in a single layer. Eichwald states that he found pavement epithelium, and others report that they have discovered ciliated epithelium in a few rare cases. In the glandular cystomata, the epithelium sinks from point to point into the depth of the cyst walls in the form of a glandular knob with a central lumen, and thus forms flask-like or cylindrical glands, which are generally very short.

The contents of ovarian cysts generally consist of a somewhat opaque brownish-red, or dirty yellowish-gray, dense stringy mass, of the specific gravity of 1018–1024. The chemical composition of the substance contained in these cysts will be referred to hereafter at some length, when, in comparison with that of other abdominal fluids, the subject will be considered in its relation to diagnosis.

Waldeyer considers the contents of the cysts to be due in a great measure to a metamorphosis of the protoplasm of the cells. This metamorphosis is very frequently attended with the destruction of the epithelial cells, for if we examine fresh gelatinous masses, lying immediately on the inner surface of the cysts, we always find a quantity of clear cells distended to roundish vesicular-like forms, with a quantity of cell detritus, varying in size and form. It is thought, in addition, that each one of these goblet-shaped epithelial cells, frequently present, may perform the functions of a unicelled gland for a time, until it finally undergoes destruction. At the same time it is scarcely necessary to state that an admixture of a simple transudate is not to be excluded.

As varieties of the cystomata, Waldeyer mentions—

1. The cystoma parviloculare, which is composed of a great number of smaller cysts, and constitutes rather compact masses, with a sectional surface like a honeycomb, has an independent existence, or constitutes the appendage of a large principal cystic space.

2. The cystoma sarcomatosum (cystosarcoma of the older writers), in which a sarcomatous texture of the walls, especially of the younger secondary cysts, may be perceived, and—

3. The cystoma myxomatosum, in which we find a myxomatous condition in the inner layers of the walls of the principal cysts and secondary cysts, and the papillary proliferations starting from them.

As processes of retrograde metamorphosis of the ovarian cystomata, Waldyer describes—

1. The fatty degeneration of the epithelial cells and the cells of the connective tissue parietal stratum, which rarely appears to any great extent.

2. The sclerotic condensations of the connective tissue in the principal cystic walls.

3. The wasting away of the cysts, proceeding from the destruction of all the secondary cysts and the atrophy of the glandular formations of the inner cystic wall and its epithelium, with which ceases all power of proliferation, and all secretion of the cystoma, the latter then remaining stationary. This process, only observed in the glandular cystomata, is the consequence of the pressure that the constantly accumulating cystic contents exercise in a certain toughness and unyielding condition of the walls.

4. Hemorrhages in the interior take place pre-eminently in papillary cystomata from the very vascular papillary proliferations.

5. The acute purulent inflammations start from the inner parietal layer of the cystoma which is well provided with cells. The abundance of the cells is then so increased that all the fibrous elements among them disappear, the vessels are dilated and contain colorless blood-corpuscles in large number. In places here and there, the epithelium in large tracts is detached from the wall of the cyst by the pus cells breaking through it, the pus pervades this epithelium and accumulates on its other side, so that the epithelium is bathed by the pus on both sides. At the point where the epithelium is detached from its substratum vascular loops soon spout up.

6. The spontaneous perforations of the cystic walls, either originate through extended fatty metamorphosis, or the cause is to be found in extensive papillary proliferations or suppurations, or gangrenous disintegration.

The ovarian cystomata develop from a hyperplastic formation of the tubules of Pflüger, and consequently can be traced to the epithelial constituents of the ovaries; *they are genuine epithelial neoplasms.* Two histological elements are represented in the ovary from its first development, the vascular stroma and the ovarian epithelium. The mass of the ovary now originates by a mutual intergrowth of the vascular stroma and the epithelial seated, it is true, in the beginning, only on its surface, with a constant increase of the two constituents. This process lasts perhaps up to birth. In this manner a roundish organ, the ovary, grows in place of the germinal epithelium expansion, orginally quite flat, in which, from the process of intergrowth, a quantity of epithelial elements is imbedded. These lie in the beginning quite disordered, and densely crowded in the meshes of the stroma, so that the section of an embryonic ovary shows quite a cavernous structure. Later, the vascular stroma increases more, while the imbedded epithelial heaps remain about equal in quantity, the latter, as a matter of course, are removed wider apart. Many of them being segregated into round follicles, other epithelial balls remain still a long time united together in the form of a chain or rosary (Pflüger's tubules), until also here, by the continually advancing development of the vascular stroma, the separation into individual follicles takes place generally around an ovular cell.

In the development of a cystoma, we have in the adult ovary quite similar relations, only there are no regularly constructed follicles with epithelial cells and ova in them. On the contrary, we find very irregularly formed epithelial deposits in the stroma, which is likewise somewhat increased, but they nowhere inclose an ovum.

If it be asked how these embryonic formations happen in the ovary of an adult, the answer must be either that the first development of the ovarian cystoma is to be dated back to a very early period, or that still later there is also a development of the embryonic forms, the tubules described by Pflüger. Both are possible, for on the one part cysts have been observed in the new born, and the most, even the largest ovarian cystoma, are to be referred to a relatively early period of life. Yet, it cannot be denied that a past embryonic development of follicular rudiments may appear as a pathological process. In favor of this view is the appearance, sometimes observed in rather old women, of small cysts, clear as water, situated close under the surface of the ovary. These are constructed quite like ordinary ovarian cystomata, they never contain ova, and at times stand in direct connection with the superficial epithelium, so that the transition of the superficial epithelium into the cystic epithelium cannot be doubted. They are produced accordingly by an additional pathological implantation of epithelium in the stroma. Moreover, at some time after birth, remains of the tubules of Pflüger are found in the ovary which have not been constructed into individual follicles, and these remnants of tubules may very well give rise to pathological transformations. Finally it is not to be forgotten, that a new growth of epithelial cells takes place also in the formation of the corpora lutea, after the evacuation of the ovum, and these are penetrated in an irregular form by connective tissue processes of the stroma containing vessels. It is true, under normal relations, the epithelial cells perish later by fatty degeneration, and only the connective tissue, shrunken to a cicatrix, remains as the corpus albicans, but under pathological relations, the epithelial cells may also continue to exist and grow to glandular masses.

If it be admitted, as Waldeyer believes he long since demonstrated, that the superficial epithelium of the ovary is not serous epithelium, like that of the peritoneum, but is a genuine mucous membrane epithelium, like that of the Fallopian tube, with which it is often continuously connected, the cylindrical cells only devoid of cilia; and if, in addition, it be proved that the epithelium of the tubes of Pflüger, and of the Graafian follicles, is derived from the superficial epithelium by a process of intergrowth; and if it is also admitted that the proliferating cystomata originate from the tubes of Pflüger, then the epithelial character of these tumors is simultaneously demonstrated.

The further growth and development of the primary small cysts into the large complicated tumors are to be referred to the cyst wall itself. In many of the primary epithelial formations, scarcely yet distended to cysts, as well also in large tumors in the smallest secondary cysts, we see, here and there, recesses in the form of tubes. In the latter case, small epithelial sacs penetrate in many places from the wall into the inner layers of the connective tissue of the cystic wall, and the beginning of the cystic formation can be often discovered in them by the saccular dilatations of the blind, or closed, ends of the tubes. These tubes open with roundish apertures on the inner surface of the walls of the cyst, and are often blocked up by a tenacious gelatinous plug. This is made the more evident when the contents of the cyst are of a very tenacious character.

The secondary cysts of the ovarian cystomata resemble, in reference to their origin, the retention cysts in other organs. According to Boettcher,[1] cystic spaces may also originate in the following manner: As the process of proliferation goes on in neighboring glandular tubes, the walls of the stroma separating them become perforated, and thus cut off many glandular proliferations that are blended together, a rather large epithelial space is formed, naturally with many recesses. The entire developmental act of a proliferating cystoma proceeds consequently from the roundish, or tubular epithelial masses, forming the precursors of the Graafian follicles. The transformation of these epithelial masses may either begin already in early childhood, when such tubes are still present in large quantity, or they are new formed in consequence of a pathological process. In one, or in many of these epithelial groups, the epithelium begins to proliferate; they grow on all sides into ovarian stroma, combine with one another now in a manifold way, and these form exceedingly irregular-shaped spaces, and ova are never met with in these formations. A secretion soon begins in these spaces, and in this way they are expanded into cysts, but at the same time numerous glandular and papillary proliferations start from the epithelium of their inner surface, and they are constricted to secondary cysts, or fill up the space within the first cyst more or less. In the secondary cysts the same processes are carried on, and so it continues in uninterrupted succession. A large number of the secondary cysts coalesce with the principal cyst, and it enlarges as well in this way as by a continuous increase of its contents. Finally, the retrogressive or other pathological processes appear, which either terminate the growth of the cystoma, or put an end to the life of its possessor.

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[1] Virchow's Archiv, 49, 3 Heft, s. 307.

Dermoid Cysts.—In regard to the development of the dermoid cystomata Waldeyer conjectures that it may take place as follows, although he admits that his views are not based upon the investigation of recent specimens. Each ovarian epithelial cell, he thinks, may become an ovular cell, and each ovular cell may produce all possible cellular characters, by division; and further, the corneal layer is the first product of segmentation. Now it may very well be assumed that the epithelial cells of the ovary, in conformity with their significance as undeveloped ovular cells, furnish, in their multiplication or division, and by budding, other products, and in fact such as are further advanced in the direction of an incomplete embryonic development than they themselves are. He does not consequently trace the dermoid cystomata in the ovary to actual fœtal remains, but to possibly fœtal inclosures, nor does he consider them as results of perverse ovarian pregnancy. He assumes a mode of development that runs completely parallel to the course of development of the myxoid cystomata, but in which the new formed epithelial cells of the cystoma assume a different character; in fact, they are epidermoidal in structure.

We have given in brief Waldeyer's views as to the development of these growths in the ovary. But while they are found in the ovary as a rule, they also sometimes develop in other organs, for which circumstance I can offer no explanation. These tumors, when situated in the ovary, develop very slowly, and never attain to the size reached by the cystomata. They are lined by a secreting surface from which the fluid contents are chiefly, if not entirely, derived, and to the accumulation of the secretion is due the increase in size. This lining membrane, giving the character to the tumor, has the properties of skin-tissue, with sebaceous and hair follicles, and, according to some observers, even sweat glands have been found. The fluid contents of these cysts are of a greasy consistency, resembling in appearance [illegible] or gruel, according to its degree of density, but in which may be seen many glistening points due to crystals of cholesterine, which often exist in large quantities. The solid contents are teeth, [illegible] hair, and great portions of bony structures in which teeth are frequently found growing, or as bony scales buried in the [illegible]. The hair is generally of a red color, growing from follicles [illegible] and is frequently found of greater lengths [illegible].

[illegible] childhood, and as a rule [illegible] when the cystomata are [illegible] these cysts are much more liable to [illegible] growths developed in [illegible] they are often the seat [illegible] the pus finds its [illegible] frequently into the vagina, [illegible] through which the solid con[illegible] have been placed on record [illegible] bladder, an accident which [illegible] they could, by removal [illegible] of the bladder, be as [illegible]

CHAPTER XXXVIII.

CYSTIC TUMORS OF THE OVARY (CONTINUED).

Unilocular cysts (monocystic, oligocystic)—Multilocular cysts (compound, proligerous, polycystic)—Stages—Rapidity of development—Symptoms—Diagnosis.

WE have seen in the preceding chapter that these tumors may develop apparently as a single cyst, although in reality this never occurs; and that on account of the number of cysts of all sizes, in a common sac, they sometimes have the appearance of a solid mass. When the accumulation is contained within what is practically a single cyst, the condition is designated by different writers as a unilocular cyst, a monocystic, or oligocystic tumor. When formed of many cysts the growth has been termed a multilocular, or compound cyst, a proligerous cyst, or a polycystic tumor. I shall employ the term unilocular to express the simple, or essentially single cyst, and multilocular, for the compound, or tumor formed of many cysts.

Dr. Peaslee[1] has conveniently divided the development of an ovarian tumor in the following manner:—

"First stage. The cyst is still within the pelvis.

"Second stage. The upper extremity of the tumor has risen out of the pelvis, and is extending to the level of the umbilicus.

"Third stage, includes the growth upward from the umbilicus to the epigastrium.

"Fourth and last stage, is that in which the growth of the tumor is such as to increase its prominence and circumference alone, it having risen in the preceding stage to its highest point.

"It is also convenient to speak of the middle of the second stage, the tumor reaching halfway from the symphysis pubis to the umbilicus, and the middle of the third stage, when it has attained to the point midway from the umbilicus to the ensiform cartilage."

The interval which must elapse between the time when the growth has just reached a size to be detected by the patient and when the increasing development will call for surgical interference must vary according to the age and temperament of the individual, and the character of the growth.

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[1] Ovarian Tumors, their Pathology, Diagnosis, and Treatment, etc., by E. Randolph Peaslee, M.D., LL.D.

These tumors are developed with most rapidity in middle life, or about the time for the final cessation of the menstrual flow. The rapidity is generally in proportion to the number of cysts composing the mass. The average time for a multilocular tumor is about a year, and for a unilocular from a year and a half to two years after it has reached a sufficient size to rise out of the pelvis, and the patient becomes conscious of its existence. But little data are to be obtained as to the average length of time of the first stage of development; but it is always a long one. In several cases under my observation, the character of the tumor was recognized two to five years before the patient herself became aware of its presence, or had suffered from any inconvenience beyond what was attributed to a supposed uterine disease. The capacity for enduring the pain and discomfort of a tumor varies in a remarkable manner with different individuals; hence the time at which it becomes imperative to interfere also varies. Instances occur where the presence of such a growth in the pelvis will establish so much local and mental irritation, that a resort to surgical means becomes necessary long before the completion of the first stage, while others bear the most advanced degree of distension with but little inconvenience.

As a rule, unless some cellulitis is established, little pain or inconvenience will be experienced in the early stage of development. Sometimes the symptoms of pregnancy are present, as nausea, enlargement of the abdomen, and pain in the breasts. The menstrual flow, however, is rarely absent, and if changed in character may become more painful and freer. Constipation, in a degree natural to the sex, is almost always increased, but a tendency to diarrhœa may take its place. Many experience a greater or less sense of pressure, or distension, while standing, somewhat similar to what is felt with retroversion.

On vaginal examination, a fluctuating mass will be detected on one side of the uterus, or filling up the posterior cul-de-sac, the uterus, as a rule, lying in front of the tumor, and anteverted. This condition may be mistaken for a cyst of the broad ligament, for a hydrosalpinx, or dropsy of the Fallopian tube, for extra-uterine or tubal pregnancy, and possibly hematocele. But it is inexcusable to confound it with retroversion, a fibroid on the posterior walls of the uterus, or with any stage of cellulitis. Time may be necessary to determine the true character, if the tumor is situated in the ligament, tube, or ovary. As long as it remains in the pelvis, it is often impossible to make a diagnosis, unless some of the fluid is obtained for examination by aspirating through the vagina; and this may be done if any urgent reasons are apparent. In extra-uterine pregnancy, the uterus is always found enlarged, and the cervix soft, while often symptoms of pregnancy will also exist, and more or less constant bloody uterine discharge. In these cases the uterus is generally displaced somewhat laterally, and the mass occupies a lower position at the side of the vagina, and is in closer relation with the uterus itself, than an ovarian cyst ever is, or a tubal dropsy, or a cyst of the broad ligament at so early a stage of development. Moreover, a difference exists in the shape of these several growths, which can be recognized by a digital examination per rectum. The ovarian cyst is almost always round and uniform in shape; a cyst of the tube is irregular, as if twisted upon itself, and generally largest at the ovarian end; and in tubal pregnancy the sac can be felt spreading out laterally away from the uterus, and ballottement can be frequently gotten, between the second and third month. Or by letting the finger rest under the sac, quietly in the rectum, an impulse can be felt transmitted from palpation over the abdominal walls, conveying the impression that a somewhat solid body impinges on the finger, and lies free in the fluid. The ovarian cyst should not be mistaken for hematocele, for if the history should give no indication of the condition, the finger will readily recognize that the cul-de-sac is filled as it would be by a fluid settling into it. But quite a different impression will be given with a cyst distended by fluid, which preserves its own special outline, while it merely rests in this locality.

When the tumor has enlarged sufficiently to rise out of the pelvis, the second stage begins, and fluctuation may be detected, and the mass can be easily moved in any direction, since a pedicle, which did not exist in the first stage, now becomes formed by the traction exerted. The fundus of the uterus is crowded at first to the opposite side, and then gradually displaced from before backward, until at length the whole organ is retroverted, and lies behind the tumor. This change in the position of the uterus almost always takes place at this stage, unless pelvic adhesions have been formed. By means of the sound, or with Sims's elevator, locked at the proper angle, it is easy to judge, from the degree of mobility, as to the connections between the uterus and the ovarian tumor. There will be more irritation of the bladder excited by the upward traction of the growth, and, as it increases in size, the bladder will gradually be forced under and behind the tumor. An ovarian tumor may be mistaken for pregnancy at this and subsequent stages, if the examination is not carefully made.

After the growth has reached the umbilicus, the third stage of development is begun. The small intestines are crowded behind the tumor, so that the whole anterior face of the abdomen will be found dull on percussion, except along the course of the colon, and the fluctuation in the tumor will be more distinct.

The fourth stage is marked by an advance in the growth, and really is only an exaggeration of the condition already existing; there is more discomfort, and usually there now appears the first evidence of functional derangement. The earliest manifest functional disturbance, resulting from pressure, is generally a diminished action of the kidneys. Digestion next suffers, with loss of appetite, irritability of the stomach, and either diarrhœa or constipation. The proper degree of nutrition is no longer maintained, the woman begins to lose flesh from about her neck and chest, the face grows thinner, and the cheek bones more prominent. The whole expression becomes so characteristic as to have been termed by Mr. Wells, the "facies ovariana." The healthy action of both the lungs and heart is early interfered with, and as the circulation becomes more and more obstructed, the veins over the surface of the abdomen enlarge, œdema occurs in the lower extremities, and sometimes in the most depending portions of the abdominal wall, and capillary action becomes so feeble that the skin is rendered dry and inactive.

The time has now arrived when relief must be speedily obtained, and the pressure exerted by the tumor must be lessened or removed, or the patient will sink rapidly from exhaustion, and ultimately die of hectic.

Pregnancy has formerly been mistaken for an ovarian tumor at the beginning of the fourth stage, but it is unnecessary to discuss the differential points, since the mistake should never occur at the present day. The two may coexist in different stages of development, and thus might render it difficult for us to make a positive diagnosis without resorting to measures which would entail the risk of producing a miscarriage. Nevertheless, with proper care and repeated examinations, we may be able to avoid falling into serious error. When the abdominal cavity becomes distended by ascitic fluid after the intestines have been bound down by adhesions, it is not always easy to say whether pregnancy or ovarian tumor exists. For unlike what is characteristic in ordinary ascites, both with pregnancy and with ovarian tumor the dulness on percussion will not be changed by shift-ing the position of the patient, since the intestines are unable to rise to the surface of the fluid.

A cyst of the broad ligament, if greatly enlarged, might be readily mistaken for a unilocular ovarian cyst, but an examination of the fluid, as of the fluid of peritoneal dropsy, will show it to be very different from that found in an ovarian tumor. The same may be stated in regard to a dermoid cyst, for its contents bear no resemblance to those of an ovarian tumor; moreover, a tumor of this kind rarely if ever reaches a size equal to that attained by an ovarian growth in its latter stages of development.

There are many other conditions which have been mistaken for ovarian tumor, but the subject is too extended a one to be treated of here at greater length, especially, since I hold that such mistakes will not now be committed by any one who has had experience sufficient to warrant his operating. The student may with much profit consult Dr. Peaslee's valuable work, in which the differential diagnosis is treated of in a most exhaustive manner. It contains also a description of renal cysts, cystic growths of the liver and omentum, and other rare conditions sometimes mistaken for ovarian tumors, but so seldom met with as to justify their exclusion from this work in favor of more practical matter.

A fibro-cystic tumor of the uterus is the only growth which, after a thorough examination, could ever be mistaken for an ovarian tumor, and it is even held that this may be diagnosed by an examination of the contained fluid. This is true in many cases, but there are exceptions where it is impossible to decide until after an exploratory incision through the abdominal walls. Moreover, I have myself had several cases, in which both an ovarian and uterine fibro-cyst existed in the same individual. This subject will be again referred to when treating of the differential diagnosis between the two conditions.

No examination should ever be deemed completed without an exploration by the rectum. The following unique case illustrates the importance of this, the record showing that without a rectal examination, it would have been impossible to determine that an ovarian tumor did not exist.

Case LVI.—Nov. 17, 1870, an unmarried woman, a native of the United States, aged 36, was admitted to the Woman's Hospital, with a supposed ovarian tumor. She stated that ten years previous to admittance, she detected a swelling as large as a goose egg, in the right iliac region, her attention having been drawn to it by shooting pains through the abdomen, and starting from this point. She began to suffer from obstinate constipation, from which she could never obtain

ing, no external bulging of the sac could take place posteriorly in consequence of the dense ligamentous structure bridging it over. Over the posterior surface of the sac, and to the right side, a network of nerves from the spinal canal extended some distance, and became gradually lost.

The sacrum was dried and prepared by removing the ligamentous tissue, which stretched across the posterior wall, where the bony structure was wanting, but the anterior surface was left entire. On examining the preparation by transmitted light, a network of large nerve filaments, similar to those on the sac, could be seen passing down directly from the canal and spread out over the whole surface. These were under a thin membrane, which was doubtless a continuation of that forming the posterior wall of the spinal canal. Where the sac had been removed, these nerves could be seen but little diminished in size, and were included in the division on the right side, throughout the whole extent. The boundary of the canal, at the point where the sac had been removed, as indicated by the rough edge, was oval in shape. It extended from the upper margin of the second sacral foramen on the right, to the position of the coccyx, and from the edges of the foramina of the third and fourth bones on the left side, to what would have been the width of the sacrum had the bone been fully developed. The edges of the sacral bone above, and of those on the left side, were gradually rounded off so as to form the funnel-shaped passage already described as leading into the spinal canal. There was a deficiency of the lower spinal process, and there was no trace of the coccyx. The case can be scarcely called one of true spina bifida. It is probable that the bone between the second and third sacral foramina was not developed, and an opening was left large enough for a sac to protrude, and the deficiency afterwards found may have resulted from absorption, as the sac gradually increased in size.

I have been unable to find any case on record where a deficiency existed in the anterior part of the spinal column. This case presented a feature of tolerance to pressure of the cord which does not exist in other cases of spina bifida except in rare instances, and then only to a limited extent. Its origin being, of course, congenital, the duration of life in this case was also a remarkable feature, and while the age was given as but 35, the patient presented the appearance of a being fully ten years older.

(This case is chiefly of interest to the pathologist, and strictly does not belong to the subject under consideration, but I point to its unique character, and the fact of its illustrating how important for differential diagnosis is the examination per rectum, as my apology for introducing it here. It was presented and discussed at a meeting of the New York Obstetrical Society, Jan. 3, 1871, and published in the American Journal of Obstetrics, Feb. 1871. A fair although too small a representation of the appearance of the sacrum is also given in the Journal. I intended to have a large drawing made of this bone, but unfortunately, without my sanction, it passed into the hands of some unknown person, who possibly desired to study at greater length its unique peculiarities. I am ignorant of its whereabouts, but hope if this should reach the eye of the present possessor, he may be prompted to return it.)

sent when the physician met with difficulty in forming a diagnosis. But now, from a more widespread knowledge of these growths, I see comparatively few cases, yet I have no doubt that they are far more common in this country than abroad. The errors which sometimes arise in differentiating between ovarian tumor and fibro-cyst of the uterus are forcibly illustrated by Case XXXII, page 562.

Dr. Peaslee also records in his book a case in which both he and I made the diagnosis of an ovarian tumor, which proved at the operation to be a single fibro-cyst or the fundus of the uterus. It was, however, removed with but little difficulty, and the woman recovered. My errors of diagnosis in this line are summed up in these two cases.

It is well to pass in review all the symptoms which have been presented as connected with fibrous tumors, because sometimes they accompany these growths before they develop a cystic character. In doubtful cases heretofore it has been regarded as good practice to make an explorative incision to determine the character of the tumor. When the parts are found sufficiently free from adhesions so that the cyst-wall can be exposed, the true character of the tumor can generally be recognized at a glance. Nothing is more characteristic than the dark and congested appearance of a fibro-cystic tumor of the uterus, so strongly in contrast with the light, clear, pearl-like hue of most ovarian cysts. This appearance, however, may be misleading, since, in some multilocular cysts of the ovary, when the several cysts are small and the fluid dense, the tumor is essentially a solid one, and when its circulation is obstructed it may resemble in color a uterine fibro-cyst. With our present knowledge there are no better means of diagnosis, in obscure cases, than the examination of the fluid contents of the growths, although even this test is often inconclusive.

CHAPTER XXXIX.

ABDOMINAL TUMORS.

[illegible] abdominal tumors and ascitic fluid considered in relation to diagnosis.

[illegible] to Waldeyer, Eichwald found the contents of ovarian [illegible] in solution chiefly two series of organic substances, [illegible] belonging to the mucin and albumen series. In [illegible] classifies mucin, colloid matter, and mucin-peptone. [illegible] albumen series, albumen, paralbumen, metalbumen, and [illegible]

[illegible] paralbumen and metalbumen is of especial importance [illegible] between ovarian and ascitic fluid. The [illegible] in Waldeyer's experience, from ovarian [illegible] the contents of the Graafian follicles are an almost pure [illegible]. The sediment of the cystic contents consists, [illegible] of cells of different size and form, [illegible] cells in a state of paralbuminous, [illegible] degeneration, with many well-preserved cylindri- [illegible] frequently cholesterine crystals, blood corpus- [illegible] granules are found.

[illegible] at the meeting of the Medical Society of [illegible] that the fluid of ovarian cysts contains [illegible] called paralbumen, the pre- [illegible] by nitric acid, was soluble in acetic acid. [illegible] albumen, was contained in the fluid from a [illegible] the precipitate formed by nitric acid was [illegible] The contents of a cyst of the broad liga- [illegible] albumen, but when present the pre- [illegible] soluble in an excess of the same

[illegible] read a paper April 20, 1876, before [illegible] Society,[2] on the [illegible] of the microscope in diagnosis of

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[illegible]

[2] The [illegible] Journal of [illegible] Britain and Ireland, April, 1877.

[illegible] Times and Gazette.

ovarian tumors, and in connection with the subject, made reference to the chemical examination. He stated that he placed the greatest reliance on the presence of paralbumen, which is soluble in strong boiling acetic acid. When the fluid was from an ovarian cyst, a coagulum formed on heating, which was either entirely dissolved, or became a transparent jelly on adding an equal portion of strong nitric acid, and continuing the application of heat. If, however, the coagulum became only partially dissolved or gelatinized, when boiled with an excess of strong acetic acid, the fluid was in all probability a mixture of both ovarian and ascitic fluid. But in doubtful cases, as an indication of ovarian fluid, he placed much value on the presence of the ovarian granule of Drysdale, which will be referred to hereafter.

The late Dr. Atlee attached much importance to the examination of fluids taken from abdominal tumors for the purpose of making a diagnosis. To his work[1] I would refer the reader for more extended details than can be given here. In regard to the diagnosis of one condition, which has been generally found by others most difficult, his experience enables him to express very positive views, viz., "In reviewing the foregoing cases of fibro-cystic tumors, it must be apparent that I regard paracentesis as the only reliable means in certain cases to be adopted, in order to make out a positive diagnosis between these tumors and ovarian cysts. I consider the fluid removed from the fibro-cystic uterine tumor to be blood, *minus* the corpuscles, or true liquor sanguinis which rapidly coagulates on exposure to the atmosphere, and after a reasonable time separates into fibrin and serum. So far as my experience goes, I have met with no other fluid removed from the abdominal cavity that undergoes such changes, nor have I met with any other form of tumor that furnishes such a fluid. It may, therefore, be pronounced not only diagnostic but pathognomonic. It is true that fluids are removed from the general cavity of the abdomen, or from local cysts having an inflammatory origin, in which are formed fibrinoid substances. But the entire mass of these fluids does not coagulate on exposure to the air, and these fibrinoid formations usually require several hours for their production, and appear like strings suspended in a large quantity of fluid, and very different from the clot and serum above referred to. It is also in accordance with my experience that, when either of the above fluids is removed by tapping, we must exclude the idea that it comes from an ovarian cyst." Dr. T. M. Drysdale, of Philadelphia, having for many years been able to examine the contents of abdominal tumors presenting in the practice of Dr. W. L. Atlee, was the first to describe accurately a cell which he calls "the ovarian granular cell." This he claims can always be found, by the aid of a microscope, in the fluid contained in the ovarian cysts. Dr. Drysdale's views are fully given in Dr. Atlee's work, and his essay on the subject will be found in the Transactions of the American Medical Association. At a more recent date he has expressed his views in the following manner.[1] "It is not a fatty degenerated cell, as Dr. Engelman has just said, but a cell characteristic of ovarian fluid, and which I have called the ovarian corpuscle, or cell. It is an albuminoid body containing little fatty particles which give it a granular appearance. It resembles in some particulars many other granular cells, but can be distinguished from all other cells found in the abdominal cavity. I have examined over 1500 abdominal fluids, and can speak with regard to the matter positively and conscientiously. The principal test I employ is acetic acid. If the cell is ovarian, the acid changes it but little, perhaps renders it only a little more transparent. But if it is a white blood cell, a lymph corpuscle, or any of those granular cells which resemble them, it will nearly always take on a different appearance; the cell almost vanishing, perhaps, and multiple (2–5) nuclei appearing, as in the pus cell. Then if the cell is suspected to be the fatty degenerated or Gluge's cell, ether may be added, by which the fatty matters will be dissolved and disappear. If no fatty degeneration be present, it is sufficient to add acetic acid."

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[1] General and Differential Diagnosis of Ovarian Tumors, etc., by Washington L. Atlee, M.D., Phila. 1873.

Dr. Drysdale can speak with more confidence than others. I believe the "ovarian corpuscle" has never been found in any other tumor, and when present may be accepted as characteristic. But unfortunately in certain cases, where the physical condition may leave the most expert observer in doubt as to the true character of the tumor, this corpuscle is sometimes not found by the microscope. In two instances of doubt, it has occurred to me that I have operated and removed ovarian tumors after experts were unable, from an examination of the fluid, to give me the slightest information in regard to the character of the tumor. We are certainly already greatly indebted to Dr. Drysdale, but I hope by further observation, he may yet be able to give a test, which can be relied upon under all circumstances.

It will rarely happen that an accumulation of fluid in the abdominal cavity could be mistaken for an ovarian tumor. But an ovarian tumor might exist with, and be hidden by an ascites, while the fluid may have resulted from the peculiar character of the ovarian tumor, or it may have been caused by some other accidental condition. The accidental causes of accumulation may be due to disease of the heart, kidneys, or liver, having no connection with the presence of the ovarian tumor; while the tumor itself may, in consequence of its size, impede the circulation with the same effect as if the obstruction was in the portal system. But the most important point of all is to ascertain, by an examination of the fluid, if a certain papillary growth exist which has been referred to.

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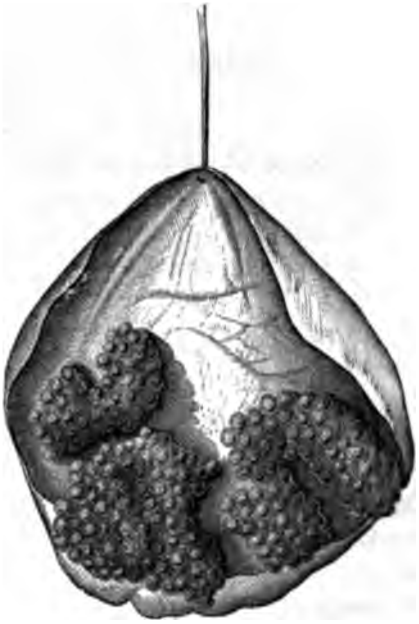
[1] Trans. Am. Gynecological Society, vol. i. 1877, p. 195.

This growth springs from the lining membrane of the smaller ovarian cysts, and, as shown in Fig. 119, begins as single papillæ, which afterwards coalesce. These develop rapidly, so that at length the wall of the cyst ruptures, and then retracts, leaving a sprouting mass projecting far into the peritoneal cavity, as shown in Fig. 120.

These illustrations were taken from drawings of a tumor removed by me in 1871, and were made by Dr. James B. Hunter, at that time one of my assistants, but now a surgeon to the Woman's Hospital.

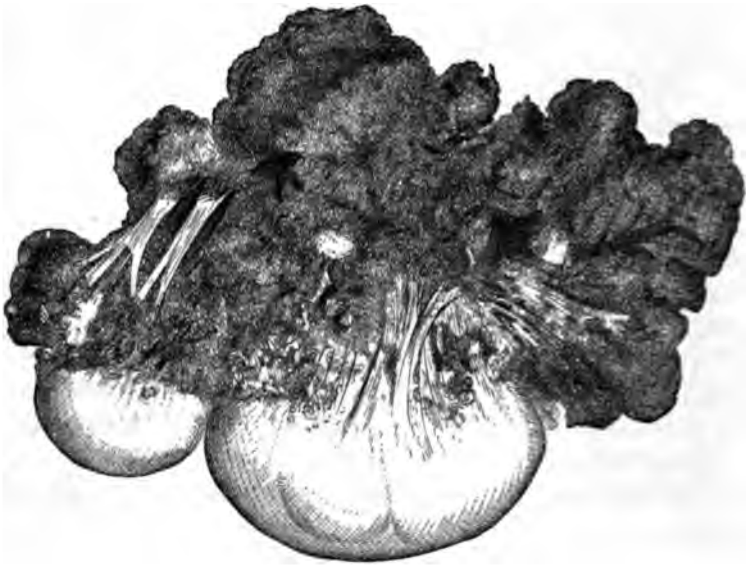
Fig. 119.



Papillary growths in a cyst.

Either as a consequence of the presence of the mass itself, or from the irritation established by the escape of the fluid also contained in these cysts, a low grade of peritonitis becomes established. This growth has been regarded as a form of malignant disease, and, for this and other reasons to be stated hereafter, it is urged that such a tumor should be removed as soon as its character be ascertained by an examination of the ascitic fluid. The few cases which have passed under my observation have nearly all recovered, as after the removal of any other ovarian tumor. The diagnosis in all was at first obscure until the ascitic fluid had been removed. This was necessary to determine the character of the mass surrounded by the fluid. I was not at that time familiar with the microscopic appearance to be described, but always recognized the condition by the presence of blood in the fluid, which increased in quantity as the pressure was lessened by removing the accumulated fluid from the abdominal cavity. With every case where this condition was suspected, preparations for the operation were made so as to complete the removal of the mass as soon as possible. I have never regarded the condition as malignant in character, or that it was in any respect more than a benign growth, accidental to ovarian tumors, and accompanied by an ascitic accumulation. I have, however, sometimes observed in this supposed malignant disease, that patients bore badly the shock of the operation, and died from apparently trivial causes. But this I have always attributed to the additional impairment of the system by the accumulation in the abdominal cavity.

Fig. 120.



Papillary projections after rupture of a cyst.

Two papers of great practical value, on "The Diagnosis of Malignant Tumors of the Ovary and Malignant Peritonitis," have appeared,[1] called forth by certain remarks made by Mr. Spencer Wells. These were made in his second lecture "On the Diagnosis and Surgical Treatment of Abdominal Tumors," delivered June 12, 1878, in the Royal College of Surgeons of England, and were as follows:—"Mr. Knowsley Thornton made a great addition to our knowledge, in pointing out that, in addition to these cells of Drysdale, which are common only in simple or innocent ovarian tumors, in malignant tumors you have these very characteristic groups of cells of different sizes. He describes them as large numbers of characteristic groups of large pear-shaped, round, or oval cells, containing a granular material with one or several large clear nuclei, with nucleoli, and a number of transparent globules or vacuoles. The cells composing the groups are many of them very large, but the great variety in size and shape is the marked feature of the group. If you will bear these different forms in mind, and these different cells, I believe you will find that they are characteristic and of great value in the examination of these fluids, putting us on our guard when we have to deal with tumors, doubtfully malignant. If these large groups of cells be seen, one may be pretty certain the tumor is malignant of some kind; or if they be found in fluid removed from the peritoneal cavity, probably a sort of infecting process has been going on in the peritoneum, from rupture of an ovarian cyst of a malignant character, these cells may have planted themselves upon some part of the peritoneum and multiplied."

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[1] The British Medical Journal, July 20, 1878, by James Foulis, M.D., Edinburgh; and September 7, 1878, by J. Knowsley Thornton, M. B., C. M.

Dr. Foulis took exception to the credit thus given Mr. Thornton, and claimed priority. Mr. Thornton in turn justified Mr. Wells's statement, saying that the latter had been familiar with his views before Dr. Foulis had first placed his on record. It is made evident, however, from these statements, that equal credit is due to each, since each began his investigations within a few days of the other, and in ignorance of the fact, Dr. Foulis states: "If the microscopic examination of the deposit in the ascitic fluid discovers numerous masses of spouting epithelium, malignant peritonitis may be certainly diagnosed. The forms of these spouting masses of cells are extremely various. Many of the larger masses may be detected with the naked eye; the microscope, however, is necessary to bring most of them in view. But whatever their form, the fact remains that they are found in great numbers in ascitic fluid surrounding malignant ovarian tumors, and if they are found in large number in *bloody ascitic fluid*, we may safely conclude that one or many villous or papillomatous growths are on the peritoneal surface." "The finding of ovarian granule cells, and a few specimens of small masses of proliferating cells in ascitic fluid should not necessarily prevent the attempt to remove the ovarian [illegible], because, as the result of experience, we [illegible] may remain perfectly well from whom such [illegible] where you find in the ascitic fluid a [illegible] masses of cells, many of which are [illegible] may be safely concluded that the peritoneum is [illegible] the ovarian tumor has formed such [illegible] as will prevent its entire removal." [illegible] masses of epithelium within the ovarian cysts [illegible] such tumors are often removed with [illegible]."

[illegible] groups to be of two kinds: [illegible] epithelium, the other of [illegible] derived not from the endo[illegible] peritoneum. Various [illegible] of lymph-corpuscles [illegible] less flattened endo[illegible] every variety [illegible] It is these latter to [illegible] malignant disease, [illegible] sarcomata and [illegible]. I have great [illegible] by these [illegible] from simple [illegible] say here that [illegible] fluid around [illegible], but whether [illegible] by rapid [illegible] at present un[illegible] as they are con[illegible] cysts containing [illegible] rupture being [illegible] peritoneum, of [illegible] and when once [illegible] a clinically [illegible] they contract [illegible] impossible. [illegible] over the [illegible] contents of the [illegible] leads me to [illegible] a process [illegible] membranes of the cysts now, but I have examined quite enough to make me certain that the form of papilloma which gives rise to infection is comparatively rare, and when it is found, it is commonly found in every cyst in the tumor, and often fungating through from one cyst to another, or to the external surface." "I still maintain that the finding of the cell-groups in the cyst-fluid is the all important point, as by prompt operation and care in performing it, we may hope to prevent infection, adhesions, or peritonitis. And I have seen more than one case giving thoroughly convincing proof of the 'practical value' of the discovery of these cell-groups while still confined to the cyst, and of the danger of neglecting to act on the warning given by their discovery. Dr. Foulis still attaches importance to the bloody or port wine color of the ascitic fluid. I have for some time ceased to do so, as at successive tappings of the same cases, I have found the peritoneal fluid of a port wine color, and then of a perfectly clear straw color; and the latter has contained just as many rankly growing cell-groups as the former." "Reading over the cases operated on by Mr. Wells, Dr. Keith, and Dr. Atlee, would not lead me to agree with Dr. Foulis as to 'so-called ovarian cancer' being common, nor would my own experience, now extending to six or seven hundred cases of abdominal tumor. I think, considering the number of ovariotomies performed and published by the leading operators, cancerous or malignant tumors of the ovary are remarkably rare, and the cases of recurrence after operation still more so. Compare the ovary and breast in this respect."

I scarcely feel that an apology is due for presenting the views of these two observers at such length. The subject is one of sufficient importance to justify the attention which has been given it, and from no other source could any information of more practical value be obtained.

In this connection Mr. Keith's views, as recently expressed,[1] are of great interest. "One's pleasure in this operation is, however, greatly marred by the frequency with which malignant disease is found at the operation, or reappears soon after it, upsetting all one's calculations. In one-fourth of my deaths, the tumors were malignant, and, with very few exceptions, in those who have died since their return home after ovaritomy, some cancerous affection has been the cause of death. Thus, amongst these, five young and healthy looking women have left me, all after severe operations, the pictures of health and happiness, and have died within a short time of peritoneal cancer."

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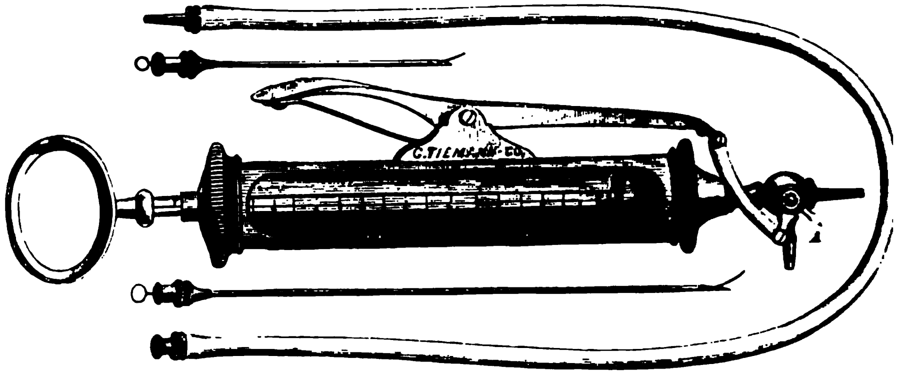
[1] Results of Ovariotomy before and after Antiseptics, by T. Keith, F.R.C.S., Edinburgh. British Medical Journal, Oct. 19, 1878.

This is certainly a remarkable experience, and confirms the statement which has been advanced, that cancerous affections are far more common in old settled countries than in our own. In the United States, cancer of the ovary, in any form, is certainly a very rare lesion. During the past eighteen or twenty years I have operated for, or have witnessed the removal of at least one hundred ovarian tumors, and I have never seen a case of cancer in connnection with one, and of papilloma I have seen only five instances. Moreover, I have never known an instance where cancer has appeared at any time after the operation, but on the contrary, having recovered, the women have then entered on a new lease of life.

To obtain the fluid for examination from an abdominal tumor by means of any trocar which would be large enough for the flow to take place through it, under the ordinary pressure of the atmosphere, would often be attended by serious consequences. Several fatal cases have been reported where death had resulted from the use of the ordinary exploring trocar. Dr. H. F. Walker, of New York, suggested and first used, in 1870, the hypodermic syringe for this purpose. There is still, however, a certain amount of danger attached even to so small a puncture, for I have had the sac become inflamed after employing the instrument; yet its use was a most important conception. The small size of the hypodermic syringe enables us to obtain only a very small quantity at a time, and necessitates its being detatched a number of times, and thus causes much incon-

Fig. 121.



Emmet's aspirator.

venience, and sometimes an undesirable amount of irritation. At one time I applied Dieulafoy's instrument to a syringe made for me by Mr. Stohlman, attaching to it the stopcock of a stomach pump (Fig. 121). By this arrangement the syringe could be emptied when required, and the exhaust again made without removing it. At Dr. Walker's suggestion the canula was made as small in diameter as that of a hypodermic syringe, and this made an admirable instrument. Yet, notwithstanding the evident advantage of the reduction in size of the canula, already six deaths have been reported as following the use of the aspirator in tapping ovarian cysts.[1]

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[1] Report of the Progress of Gynæcology during the year 1875, by Paul F. Mundé, M.D., Am. Journ. Obstet. April 1876; and Vaginal Ovariotomy, by Dr. Wm. Goodell, Trans. Am. Gyn. So., vol. 2, p. 277.

CHAPTER XL.

TREATMENT OF OVARIAN CYSTIC TUMORS.

Internal remedies—Surgical treatment: tapping; injection of iodine; drainage; vaginal ovariotomy; abdominal ovariotomy.

We need consider only briefly the treatment of ovarian tumors by internal remedies. Formerly a number of drugs were more or less noted for their supposed efficacy, but they have all been proved to be valueless. The inference is, that in cases where they were supposed to be serviceable, there was an error in diagnosis, and as their virtues were held to be due to their action on the kidneys, it becomes very probable that ascites was often mistaken for ovarian tumor. By increasing the action of the skin, kidneys, and bowels, some patients may, perhaps, be temporarily relieved of their discomfort, but it is well established that no remedy, internally administered, can produce the slightest change in the contents of an ovarian tumor.

The various surgical measures may be classed as follows:—

Tapping.
Injection of iodine.
Drainage.
Removal of tumor through the vagina, or by abdominal incision.

Tapping should be regarded as palliative only, and should never be resorted to except for making a diagnosis, or to gain time when the condition of the patient does not yet admit of an operation. It is only applicable to single cysts, and should never be employed in the multilocular variety. Under the most favorable circumstances, according to Dr. Peaslee, one death in every twenty-five or thirty cases occurs from the first tapping. The chief dangers arise from peritonitis, which may be excited by the escape of some of the contents of the cyst into the peritoneal cavity, or from blood poisoning, the result of inflammation of the lining membrane of the sac. There is also a certain risk from hemorrhage if the omentum, which is often adherent to the front of the tumor and lower than usual, is wounded; and it is even possible that the stomach or colon, as we shall show hereafter, may be so displaced by adhesions as to be exposed to the trocar. The larger the cyst and the nearer it comes to being to a single one, the less irritating will the fluid be to the peritoneum. Repeated tappings are attended with comparatively little danger of exciting peritonitis, for, if no disturbance arises from the first one, the inference is fair that the tumor is adherent to the abdominal walls. While danger from inflammation in the sac always exists, it is also less liable to occur after subsequent tappings. The character of the fluid generally changes from that obtained at the first tapping, losing its original transparency, and becoming more dense. In many cases tapping may have been resorted to for years before the strength of the patient succumbs to the continued drain. Occasionally single cysts do not refill after having been tapped, but, as a rule, when this occurs, the probabilities are that the tumor is a cyst of the broad ligament, the fluid from which is bland and unirritating to the peritoneum. When the contents of a tumor of this character escapes into the abdominal cavity, through the puncture in the cyst wall, it will be absorbed. As the cyst is thus kept empty it rapidly contracts, until at length adhesions form, the lining membrane is changed in character, secretion ceases, and the tumor disappears. In rare instances this also may occur with an ovarian cyst, either when tapped or accidentally ruptured.

The operation of tapping is a simple one, for which the aspirator should be used, or a trocar longer than the one usually employed for ascites. It should always be done under the carbolic spray, and care should be taken to prevent the entrance of air into the sac. As a rule, I prefer to place the patient on a narrow couch, and tap while she lies on the side. With all other considerations equal, the median line, midway between the umbilicus and pubis, is the safest point for making the puncture. Yet if it were ascertained that the main cyst presented to either side of the median line, I would puncture at the most advantageous point, out of reach of the bladder, colon, and stomach. Wherever the point selected, it should be where a marked dulness on percussion exists and extends for some distance around.

Unless a very large trocar be used, it will not be necessary to make an incision through the skin, as is usually done on emptying the abdominal cavity, nor will a bandage be required.

The requisite support and pressure must be kept up by the hands of an assistant, placed at some distance from, and below the trocar. He should stand behind the patient and carefully steady her body as she is rolled over to empty the cyst. The operator should seize the relaxed tissues about the trocar, between his thumb and second finger, and at inch or more beyond the point of puncture. This is done to prevent the contents of the cyst from escaping into the abdominal cavity. The patient is to be then turned on the back, and the trocar removed while the tissues are still grasped. The exit of the instrument can be aided by placing the nail of the index finger, which is disengaged, against the skin at the edge of the puncture. A small piece of adhesive plaster should be placed over the puncture, and as the relaxed walls are held together, by pressure made on each side with the flat of the hand, two broad strips of plaster should be applied from under the flank, obliquely across the abdomen, to the neighborhood of the false ribs on the opposite side. Unless it be determined to inject the cyst, the use of Dieulafoy's aspirator is far preferable for making the first evacuation. The advantage of this instrument is that it affords greater immunity from evil consequences if a large viscus or bloodvessel be injured, and also entails less danger from peritonitis and inflammation of the sac. When the contents of an ovarian tumor are too dense to pass through the largest canula of the aspirator, and this is rare., the case will seldom prove a good one for tapping. We must not suppose the tumor to be a solid one, should no fluid escape, for it is immediately shown not to be solid if the canula can be moved freely in every direction.

While the tumor is yet very small, and probably formed by a single cyst lying in Douglas's cul-de-sac, the practice of tapping through the posterior cul-de-sac of the vagina has been advocated.

Dr. Noeggerath[1] has treated a number of cases, in which the cysts were small, by puncturing them from the vagina with the hypodermic syringe as a trocar, and has been so well satisfied with this operation that he says he has never found it necessary to remove these cysts by vaginal ovariotomy, an operation to be described hereafter. It is held that while these cysts are so small, the fluid contained in them is of so bland a character as to be unirritating to the peritoneum, and if it continues to escape through the puncture, success will be the more probable, as has been stated, when the cyst is thus kept collapsed. With other cases, as soon as the cyst can be recognized and at the earliest stage of development, while its walls are thin and the fluid unirritating, Dr. Noeggerath ruptures the cyst by pressure between a finger in the vagina and the hand upon the abdominal wall under the hope that it may not refill.

I have never ruptured such a cyst, yet if the diagnosis can be made out early enough, I do not believe that any serious consequences would arise. But I have punctured several somewhat larger cysts with a trocar from the vagina, and in every instance more or less cellulitis has resulted. This might have destroyed the cysts, but I am unable to determine that, for the cases all passed from under my observation. Yet should one of these cysts fill again and continue to develop it would be most probable that pelvic adhesions, as a result of the attempted cure by rupture, would be encountered in any attempt to remove the tumor.

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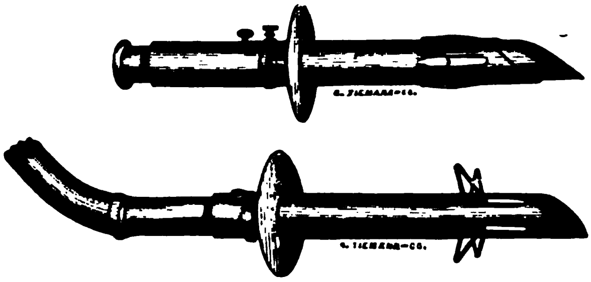
[1] Transactions of the Am. Gynæcological Soc., vol. 2, p. 275.

Injection of Iodine into Ovarian Cysts.—Dr. Alison, of Indiana, according to Dr. Peaslee, was the first to place on record (1846) the history of a case cured by injections of iodine, but to Boinet is due the credit for establishing the practice as a suitable one under certain circumstances.

It is only applicable in just such cases as we have pointed out as proper for tapping. When the cyst is large and the tumor practically unilocular, and free from adhesions, the careful injection of iodine into it will sometimes be followed by good results. The iodine is not injected for the purpose of producing adhesive inflammation of the cyst wall, for this would lead to suppuration and blood poisoning. Its effect is in some way to arrest the secretion of the cystic fluid, and to change the character of the lining membrane, after which the sac shrivels away from being kept no longer distended. When iodine is injected into a pyogenic sac, after the pus has been evacuated, it acts beneficially by changing the character of the lining membrane.

Fig. 122.



Thomas's trocar.

Before injecting the iodine, the cyst should be tapped with rather a large size trocar, of sufficient length to insure the instrument against slipping out of the sac as it becomes emptied. One devised by Dr. T. G. Thomas answers admirably for this purpose, as it can be fixed within the sac by projecting out, like the ribs of an umbrella, a number of small arms, or spurs, near the end of the canula (Fig. 122). A great advantage of the instrument is that it enables the walls of the cyst at the puncture to be held in close contact with the abdominal wall, so that there can be no escape of fluid into the peritoneal cavity.

After the cyst has been emptied, a sufficient quantity of warm water should be injected to wash off any ovarian fluid that may be adherent to the lining membrane. This is done by attaching to the canula a short piece of tubing connecting with a Davidson's syringe. The water is withdrawn by reversing the syringe. It is of the greatest importance to exclude air from the cyst, a small quantity being sufficient to cause inflammation of the lining membrane of the sac, and its consequences. The operation, therefore, should be done under carbolic acid or some other antiseptic spray. Before the antiseptic method was in vogue, I was in the habit of applying a clamp to the rubber tubing to prevent the entrance of air.

The syringe is to be filled with the undiluted tincture of iodine, U. S. P., and thrown directly into the cavity of the cyst. After detaching the syringe, the patient must be turned slowly from side to side and placed in the upright position for a few moments, so that the iodine may be brought in contact with as large an extent of surface of the sac as possible, and the more effectually this is done, the greater will be the success obtained.

As it might prove a source of irritation, and even excite peritonitis, should any quantity of the iodine escape into the abdominal cavity, it must be carefully withdrawn from the cyst. This can be readily done by turning the patient somewhat over on the face, as she lies on the edge of the bed, so as to bring the puncture to the most dependent part of the body.

If the canula has no vents or slots near its extremity to give exit to the last layer of the fluid, it will be necessary by skillful manipulation to depress its inner end until brought in contact with the cyst wall; when, if it is properly done, not only will all the iodine come away, but with it any air which may have accidentally entered, and the walls of the collapsed cyst will fall closely together.

In the usual method of tapping, when the cyst is to be injected, a long canula of sufficient diameter to pass a large size flexible male catheter is employed, and when the canula is withdrawn, the catheter is left, reaching to the bottom of the sac. The cyst is washed out through the catheter, and the iodine injected by means of a glass syringe, the nozzle of which exactly fits the mouth of the catheter.

This method, however, is very imperfect in comparison with that in which Thomas's trocar is used.

When adhesions exist the walls of the cyst will not be brought in contact, nor can the size of the cavity be materially diminished. It cannot be determined beforehand whether there are any adhesions, but if some are found no evil consequences are likely to follow the injection of the iodine, for, as a rule, this produces less disturbance than a simple tapping.

Mr. Wells has recently advocated[1] the following practice: "So I think we may lay down, as almost a positive rule, that, when we can be sure that the cyst is a single cyst, and we cannot discover any secondary growths in the cyst wall by examination by either the abdomen or the vagina, we must consider it a duty to see what tapping will do for a patient before adopting more serious measures. I think I have seen quite enough now to warrant me to endeavor to impress upon surgeons that, if the cyst be a single cyst, before they do anything else, they should see what can be gained by one tapping. If the tapping be done with precaution, the risk is extremely small; the patient loses nothing, and may be cured." This is contrary to what has been heretofore accepted, but as it is advocated by a careful observer, one who has had a greater experience than any other operator, its propriety can now be scarcely questioned.

I would, however, recommend that, whenever such a cyst is tapped, it be washed out and iodine injected into it, in order to lessen the probability of its refilling.

All authorities agree in the opinion that the injection of iodine is of no benefit, but is often hurtful, when thrown into a multilocular tumor. My experience fully confirms this, and yet the result in the following remarkable case may, in this respect, as in many others, be cited as an exception to the general rule.

Case LVII.—Mrs. Kate D., aged 28, was admitted to the Woman's Hospital, Dec. 1, 1874. She had given birth to two children, and had miscarried several times. About eighteen months before admission, she first noticed a movable mass on the right side. She became pregnant shortly afterwards, and at the third month consulted a physician who proposed to operate notwithstanding her pregnancy. My opinion was asked, and I urged that she should go to full term, and have the operation afterwards if needed. My advice was followed, and as the pregnancy advanced, the tumor was crowded up and over to the left side, but without apparently increasing in size. In fact, it seemed to become smaller after an attack of vomiting, shortly before delivery, when she threw up a large quantity of dark coffee colored fluid. At my request she was attended by Dr. George T. Harrison; the labor was a natural one, and afterwards the tumor dropped back again to the right side. Her general health was good, and she was able to nurse her child, but the growth of the tumor increased so rapidly, and she suffered so much irritation of the stomach, that Dr. Harrison was obliged to tap her. This afforded great relief, and had the effect of greatly reducing the size of the mass.

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[1] British Medical Journal, June 29, 1878.

At the date of her admission she was suffering chiefly from dyspepsia and irritability of the stomach.

On examination a globular tumor was found with the abdominal wall drawn apparently tense over it. Fluctuation was very obscure, and percussion gave dulness over all of the abdomen, except just above and to the left of the umbilicus. This resonant portion was supposed to correspond to the transverse colon, which it was even thought could be seen through the unusually thin abdominal wall. From the vagina no portion of the tumor could be felt, while the uterus was found of normal size and retroverted, but movable.

Dec. 3d. I began the operation in the presence of Drs. Peaslee, T. G. Thomas, George Harrison, Bache Emmet, and others of the Hospital Staff.

The first incision was some five inches in length, and was carried down carefully to the tumor, when a portion of what was supposed to be an adherent intestine presented itself. Two fingers were passed at the upper angle between the parieties and tumor, from which point the abdomen was laid open with a pair of scissors nearly to the ensiform cartilage, the tissues being divided between the fingers as they were advanced for protection. The incision was also extended to the pubes. No adhesion existed to the abdominal wall, but when the flaps were turned back, a condition was discovered unique and, I may add, startling, on account of the difficulties presented. The stomach, colon and omentum were all adherent to the surface of the tumor and below the line of the umbilicus, while the whole upper portion of the tumor was covered by peritoneum placed on the stretch by the displaced organs. The tumor was inclosed by viscera at every point within reach, except just above the bladder, nearly to which the omentum extended. The empty stomach and colon lay on the surface of the tumor, resembling wet pathological preparations, and were adherent by the whole surface in contact. Notwithstanding it was suggested that the tumor might be removed from above, and by getting behind it, as these were apparently the only adhesions, I closed the incision as soon as possible.

The woman was placed in bed and began to vomit violently, apparently from the effects of the ether. Rupture took place between the stomach and tumor, and, in the course of several hours, the tumor was entirely emptied of its contents.

The fluid and semi-fluid substance was almost sufficient to fill two buckets, and were of various colors, showing that the cyst walls ruptured into each other, until at length the tumor became essentially a single cavity, and collapsed for the time. For a week or more her condition was critical, during which time she was nourished entirely by the rectum. It was feared that if food were introduced into the stomach, it would pass into the ovarian sac, and set up inflammation and blood poisoning.

At the end of a month she returned home with the tumor already beginning to refill. About a month afterwards I advised Dr. Harrison to tap her, selecting a fluctuating point above the umbilicus where it was dull on percussion, and where the stomach should have been under ordinary circumstances. I had called his attention to this peculiarity at the time of the operation, and noted the spot as being the only one where she could be safely tapped. The cyst was tapped at this point with Thomas's trocar, emptied and thoroughly washed out with warm water previous to injecting iodine. As the doctor was withdrawing the canula, and when apparently it was just out of the cyst wall, a jet of blood, a foot or more in height, was shot through the instrument. Dr. Whitwell, then house surgeon to the Woman's Hospital, was assisting and lifting up the relaxed abdominal wall with the canula in his grasp; pressure was made on all sides. It was found that as long as this was done there was no bleeding. The pressure was maintained by compresses, and, after removing the canula, an abdominal bandage was applied.

The woman was very ill for two months afterwards, suffering from inflammation of the sac, with more or less blood poisoning, followed by pelvic cellulitis and phlegmasia dolens in the right leg. She gradually recovered her health, had another miscarriage, and then a child at full term. Dr. Harrison attended her and informed me that he could detect no trace of thickening or adhesions, and he felt satisfied that these had been absorbed, and that the stomach and transverse colon had returned to their normal position.

At the time of writing this history, after an elapse of four years, she is in excellent health, and nothing is to be detected beyond some thickening in the pelvis, probably the remains of the cellulitis from which she suffered.

I do not cite this case in proof solely of the value of iodine injections, for the disappearance of the cysts, may have been brought about through the occlusion at the time of the injection, of the main bloodvessel by which they were nourished. The woman certainly suffered far more, and her life was in greater danger than would have attended the ordinary removal of an ovarian tumor.

Treatment of Ovarian Tumors by Drainage.—The occasional efficacy of this plan of treatment was known before the removal of an ovarian tumor had become an accepted operation.

The object of drainage is to establish a permanent opening through which the sac may be kept empty until it finally disappears. It was customary to establish the opening either through the abdominal walls, the posterior cul-de-sac of the vagina, or the rectum. An abdominal fistula, except for some special reason, would now rarely be made for the purpose of drainage, since no benefit could be looked for unless the opening were placed at the lowest portion of the cyst. An opening into the rectum would always be objectionable in consequence of the possible passage of flatus and feces into the cyst. Whenever the cyst is within reach it would be best to establish the drainage through the posterior cul-de-sac of the vagina.

Dr. Noeggerath has reported[1] several successful cases treated by drainage through the vagina, and recommends that only one cyst should be punctured at a time as it presents, in consequence of the previous one having contracted. He has made the process far more efficacious by securing, with interrupted sutures, the edges of the opening in the sac to the incision through the wall of the posterior cul-de-sac.

With our present knowledge and facility for the removal of ovarian tumors, this operation should never be resorted to unless the tumor is so firmly adherent in the pelvis as to render it very dangerous to attempt to separate it from the surrounding tissues. Under these circumstances the treatment by drainage is admissible. The thorough washing out of the sac is important, to guard against blood-poisoning, and to lessen the amount of secretion from the lining membrane, thus preventing a serious drain upon the patient's strength. The hot water employed should, from time to time, have added to it proper quantities of tincture of iodine or carbolic acid.

Ovariotomy, or the removal of an Ovarian Tumor through the Vagina, or by Abdominal Incision.—In consequence of local disturbance, or on account of some reflex irritation, or the mental condition of the patient, it may become advisable to remove an ovarian tumor at a very early stage of development.

While yet small, as has been pointed out, the tumor almost always lies in Douglas's cul-de-sac. To remove it an incision may be made in the septum, the tumor drawn into the vagina, and separated from its attachments.

Dr. T. G. Thomas, in Feb. 1870, was the first to undertake this operation with a distinct purpose, and the result was successful. The details of the case and the different steps of the operation are fully given in the report published in the *Amer. Journ. of Med. Sciences*, April, 1870, and in the last edition of his work on the diseases of women.

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[1] On Ovariocentesis Vaginalis. Amer. Journ. of Obstetrics, May, 1869.

I was familiar with the fact that Dr. J. T. Gilmore, of Mobile, and Dr. Clifton E. Wing, of Boston, formerly attached to the Woman's Hospital, had each a successful result after this operation. Dr. Wm. Goodell, of Philadelphia, has placed on record[1] a similar one, performed by himself, and cites, in addition to these, one by Dr. R. Davis, of Wilkesbarre, Penna., and another by Dr. Robert Battey, of Georgia, making six cases of cystic disease removed by vaginal ovariotomy, operated on in America, and all terminating favorably.

Dr. Goodell also places on record the fact that the late Dr. Washington Atlee, in February, 1857, opened into an accumulation of puriform fluid filling Douglas's cul-de-sac, no clear diagnosis having been made of the case. On March 13 following, the incision was enlarged and the mass detached from its adhesions as far as the finger could reach. The operation was then suspended with the hope that nature would complete the removal of the tumor. Finally, March 25, the character of the tumor being fully determined, the mass was drawn down into the vagina and removed as the adhesions were broken up. This operation was not based on any fixed plan from the beginning, and had rather an accidental termination, therefore it should not vitiate Dr. Thomas's claims to priority.

In this interesting paper Dr. Goodell gives a remarkable case, and, as he thinks, a unique one, where an ovarian tumor was successfully removed per rectum by Dr. W. W. Shocks, and reported in the *Bost. Med. Journ.*, October 16, 1875. The tumor projected through the anus, having carried the anterior wall of the rectum before it. The diagnosis was made clear on recognizing the Fallopian tube, which could be felt from the vagina and rolled between the finger and tumor. The tumor was removed by making a longitudinal incision through the rectal wall covering it.

The history given by Dr. Goodell of his case, and of the one operated on by Dr. Wing, clearly shows the necessity for leaving the wound open for drainage, and for washing out the cavity, as a precaution against septic poisoning. Dr. Thomas secured the pedicle by means of a ligature, which was cut off and returned, and the wound closed by interrupted sutures. The woman suffered from an attack of cellulitis, which was attributed to carelessness on her own part.

The range for this operation must necessarily be very limited, and confined chiefly to the conditions I have already enumerated.

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[1] A Case of Vaginal Ovariotomy. Trans. of the Gynæcological Society, vol. ii. 1877.

Ovariotomy by Abdominal Incision.—To trace the history of this operation from its conception to its present state of development, would be an undertaking too extensive for the scope of any work so general in its character as this. A review alone of the literature would be an immense task, since the subject has attracted more attention within a few years past than perhaps any other within the range of surgery. The late Dr. Peaslee thoroughly exhausted it in his classical work on Ovarian Tumors, but within the past six years, since his book was published, more has been written in reference to it than ever before.

Through the efforts of Dr. Peaslee, the credit is now accorded throughout the world to Dr. Ephraim McDowell, of Louisville, Ky., as being " the father of ovariotomy," he having performed the operation in December, 1809, long antedating all other operators. To many practitioners in this country and in Europe we are indebted for important contributions to our knowledge of ovariotomy.

But chiefly to Mr. Spencer Wells, we must acknowledge our obligation for his great service in popularizing the operation, and making its details so familiar to us. The world is largely indebted to him for his valuable teaching, and his name will always be honored whereever ovariotomy is known.

To the remarkable success attained by Dr. Charles Clay, of Manchester, England, after 1842, we must attribute the acceptance of the operation by the profession not only in England but in this country. To him is certainly due the impulse given to the development of the operation in this country by the Atlee brothers, an impulse so favorable that, according to Dr. Peaslee, eighteen American surgeons had performed the operation previous to the year 1850. A more accurate knowledge of the operation was obtained by the publication in 1855 of Dr. Atlee's first thirty cases, and in the following year a prize essay on ovariotomy, was written by Dr. G. N. Lyman, of Boston, which was the most thorough and exhaustive treatise on the subject which had appeared up to that date. After 1860 the number of operators increased so rapidly, that I cannot do more than refer in a general way to the most important contributions on the subject. Before entering upon a detailed account of the operation, a chapter must be devoted to a consideration of the conditions which may complicate it.

CHAPTER XLI.

CONDITIONS WHICH MAY COMPLICATE THE OPERATION OF OVARIOTOMY.

Inflammation of the sac—Peritonitis and ascites—Adhesions—Size and long existence of the tumor—Pregnancy—Cancer—Phthisis—Renal disease—Uterine fibrous tumors—Disease of the other ovary.

THE conditions which may complicate the operation for removing an ovarian tumor are:

Inflammation of the sac.
Peritonitis and ascites.
Adhesions.
Size and long existence of the tumor.
Pregnancy.
Cancer—Phthisis—Diseases of the kidneys.
Uterine fibrous tumor.
Disease of the remaining ovary.

Inflammation of the sac although of vast importance, is not always recognized. Symptoms of blood poisoning are generally present, and the appearance of the patient is indicative of a "typhoid condition." The access of the inflammation may or may not be ushered in by a chill; the pulse increases in frequency, and is attended at the outset by a great rise in the temperature of the body. The tongue is red, pointed, and dry; the teeth are often covered with sordes; there is more or less irritability of the stomach; and there are stages of moisture of the skin, or sweating, notwithstanding the elevation of temperature. The abdomen is sometimes tender on pressure, and sometimes entirely free from pain. As the case advances, the mind becomes more or less affected, even to delirium. At length the kidneys being overworked, the poison is no longer eliminated from the blood, and death begins at the nerve centres through failure of their nutrition.

This "typhoid condition" was formerly generally accepted as an omen of death. It was thought to be an indication of irreparable loss of vital force, due to the long continued irritation exerted by the pressure of the tumor. Few were bold enough to attempt to remove a tumor from a woman in such a condition, and she was allowed finally to die without surgical relief. One of the great advances which modern gynæcology has made is, that we now recognize that this state, which was formerly thought to be ominous of death, is an indication that an immediate operation is called for. This advance could have been made only by experience, for certainly upon every *à priori* ground we should expect any patient operated on in such a condition to sink from shock before the operation could be completed.

It is true, whatever her condition, she may die from the immediate effects of the operation, but she certainly must die, and at an early day, if the cause of the blood poisoning is not speedily removed.

This condition of the patient is sometimes one of apparent exhaustion only; it is at first rather an indication that the nerve centres are overwhelmed by the presence of the poison in the blood, and not that there is an actual loss of power which cannot be regained. I have seen several remarkable instances where women were apparently snatched suddenly, as it were, from the grasp of death upon removal of the inflamed sac.

The following case will not only illustrate fully this part of the subject, but also the difficulties sometimes encountered in forming a diagnosis.

CASE LVIII.—Mrs. W., aged 42, consulted me Nov. 13, 1877. She had given birth to two children, the youngest then 22 years of age, and she had a miscarriage at three months, ten years after the birth of the last child. After having menstruated very freely for many years, she became irregular the year before admission, and supposed that she was approaching the menopause.

In April, 1877, she noticed for the first time an elargement on the right side. This was recognized by her physician as a fibrous tumor, and she was placed on unusually large doses of ergot. After much suffering she was seized at the end of a month with an attack of peritonitis, which confined her to bed for three months, during which time the abdomen increased rapidly in size. Menstruation continued free, but seldom lasted more than five days. She was placed on "Cutter's diet," and at the end of a month began to lose flesh rapidly.

She had been informed by her physician, a month before consulting me, that she had a fibrous tumor, and was incurable. For one month she had had a continuous flow.

I examined her without any knowledge of the diagnosis made by her physician, expressed the opinion, and placed it upon record, that she had an ovarian tumor, the nearly solid portion of which was just below the sternum, and, between this mass and the pubes, at least two large cysts with unusually thick walls. The uterus was five inches deep, and drawn well up into the pelvis. There was no evidence of the tumor to be discovered from the vagina, but the remains of some thickening of a former cellulitis were detected on the left side in, as was supposed, the broad ligament.

Learning then for the first time the opinion which had been given by a physician of experience, and for whose intelligence and skill I have the highest respect, I advised her to consult Dr. Peaslee, and without giving him my conclusions. He decided that it was an ovarian tumor. Dr. T. G. Thomas was also consulted, and he confirmed the diagnosis.

The case was placed in my charge for operation as soon as her condition should be deemed favorable. Nov. 19, I withdrew, by means of a hypodermic syringe, some of the fluid from a cyst on the right side, where fluctuation was distinct and dulness marked; this became solid on standing a few moments. I had already taken some from the opposite side, which, remaining liquid, I had examined with the microscope, when it was pronounced not to be ovarian fluid, but its character could not be defined. This puncture of the tumor was followed by an attack of supposed peritonitis, which was marked by an increase of pulse and temperature, tenderness on pressure along the sides of the abdomen, and irritability of the stomach. After a week this attack seemed to subdside, but her general condition did not improve, while the size of the tumor increased rapidly.

Dec. 8. I regarded her condition as so critical that I called Dr. Peaslee in consultation, and it was decided to tap her immediately. This I did, the patient lying on the side, and drew off 23 pints of fluid, emptying both cysts by pressing the end of the canula through the septum between the two after the first cyst had been emptied. In doing this I felt certain that I fully appreciated the relative position of the cysts, yet the practice cannot be recommended as being free from danger. When both cysts had been emptied, there remained the hard mass above, which could be felt through the abdominal wall, passing down behind as a solid body into the pelvis. She was too much exhausted afterwards to admit of a more thorough examination. Dr. Peaslee took for examination a portion of this fluid, which to the eye and by gas light had the appearance of ovarian fluid. But the result of his examination, coupled with the character of the tumor after tapping, unsettled his diagnosis, and he was unable to decide as to its nature. I sent some of the fluid to Dr. James B. Hunter, of the Woman's Hospital, who pronounced it ovarian, but stated that he found very few ovarian corpuscles. Another expert who examined the fluid for me stated positively that it was not ovarian. Dr. Drysdale, of Philadelphia, had very kindly offered, some time before, to make an examination for me in such a case, and as I had expressed a doubt as to the uniform reliability of the microscopic test, I sent some of this fluid to him, stating that there was a difference of opinion in regard to the tumor, whether a fibro-cystic tumor of the uterus or ovary. In justice to the doctor, I must state that he found the quantity too small for a complete examination. He wrote that, "if it were not for

[illegible]

[illegible] to enter into the details of this case, for I [illegible] by a simple statement that cases are met [illegible] where sometimes no amount of experience enables us [illegible] from a physical examination, as to the true character of the tumour, and further, that even in the hands of the most prac[illegible] the microscope cannot always be depended upon.

There are other circumstances connected with this case of the greatest importance, and although not bearing on the subject under consideration, more than the above remarks regarding the diagnosis, they may as well be cited in completing the history of the operation.

The adhesions were separated over a much larger extent than usual, but the spray seemed to control the oozing, for in instances where they have been much less, and where the spray was not used, I have been delayed by the oozing for an hour or more longer than in this case. It was noted by all present that the effect of the carbolic spray was to cause rapid capillary contraction, and that under it the amount of oozing was insignificant. The parts gradually returned to a natural color, and at the termination of the operation all appearance of the peritonitis had disappeared. The time thus gained in this case doubtless aided the patient's recovery.

But the most interesting circumstance in connection with the use of the spray was the disappearance of the septicæmia. At the beginning of the operation the patient was suffering from symptoms of profound blood-poisoning, and particularly from irritability of the stomach. She awoke from the effects of the ether as from a natural sleep, without nausea or any other evidence of blood-poisoning.

When treating of fibrous tumors I called attention to the probable effect of large doses of ergot in producing peritonitis. The history of the case just given resembles very closely several others which have passed under my observation, in which, through error in diagnosis, large doses of ergot were given, and were followed by peritonitis, which, I cannot but feel, was due to the drug. If this be true, it can only be explained by the suppositon that the ergot acted as a local irritant, producing intense congestion in the pelvic vessels, and as there was no organ or condition upon which it could exert a salutary effect, inflammation resulted. I am satisfied, from observation, that an immense deal of harm is done by the injudicious use of ergot, even when the drug is indicated, and particularly in the administration of unnecessarily large doses.

Peritonitis and Ascites.—The existence of peritonitis does not necessarily contraindicate an early removal of the tumor. On the contrary, as the presence of the tumor is often the cause of irritation, peritonitis may be an indication for an immediate operation. In chronic peritonitis, where the peritoneum has been long subjected to the pressure of the tumor, its character is so materially altered, and it is so little responsive to irritation that, unless extensive adhesions exist, the patient's chances for recovery are often better after the removal of the tumor than if the peritoneum were in a perfectly healthy condition.

After rupture of a cyst in a multilocular tumor the operation should not be delayed longer than necessary, to insure a reaction from the shock. It is good practice, under these circumstances, to open the abdomen before inflammation can set in, and remove the tumor and the contents of the cyst which had ruptured and discharged into the peritoneal cavity. This is an accident which almost always terminates fatally from peritonitis, if the contents of a cyst be left in the cavity. It is essentially a foreign body which cannot be absorbed, and as such excites peritonitis and ascites.

Dr. Peaslee in his work states (page 75) that he had seen five cases of spontaneous rupture of polycysts, and four of these had died of peritonitis within five days after the accident. "The remaining one slowly recovered, and the tumor was successfully removed by ovariotomy about a year afterwards by Dr. T. A. Emmet, of the New York State Woman's Hospital." This remarkable case was reported [illegible] physician, Dr. S. A. Raborg,[1] through whose recommendation she was sent to the Woman's Hospital. The following constitute the [illegible] features of the case:—

[illegible].—Mrs. L., aged 33, was attended by Dr. Raborg in her [illegible] confinement, Jan. 14, 1868. Several mouths afterwards she [illegible] enlargement, which the doctor recognized, in September of [illegible] and hard ovarian tumor on the left side, which [illegible] by Dr. Peaslee. On the following October [illegible] was sent for in great haste to see the patient, who [illegible] and was then in a state of collapse. This was [illegible] rupture of a cyst. The kidneys were very active [illegible] the peritoneum began to fill, and four months [illegible] tapped by Dr. T. C. Finnell. Present, Drs. [illegible] of Ga., the house staff, and others. The [illegible] umbilicus was thirty-seven and a half inches. [illegible] Sept. 28, 1869.

[illegible] was made extending from the umbilicus to [illegible] The abdominal walls were very thin, and a [illegible] escaped from the peritoneal cavity, evi- [illegible] cyst which ruptured Oct. 11, over one [illegible] chronic peritonitis, but no adhesion to [illegible] to the omentum. A Wells' trocar was [illegible] fluid escaped until the colloid or jelly- [illegible] out with the fingers; then a dark, [illegible] changing in color and density as one [illegible]. The pedicle was secured by a [illegible] stitch, and the stump was re- turned [illegible]. There was nothing remarkable to note in the convalescence. She bore two children afterwards, and

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[1] New York Med. Journ., April, 1876.

Dr. Hadden, of this city, who attended her, informed me, October 6, 1873, that she had passed through her labors without difficulty. Dr. Raborg sums up the points of the case as follows: "The special interest in the case is, in the first place, that a multilocular tumor should rupture, emptying the contents of one of its cells into the peritoneal cavity, and the patient survive the shock and censequent inflammation; secondly, that from the history of the case there is little doubt that this rupture never healed, and the secretion from the sac continued to flow into the peritoneal cavity up to the time of the operation, or for more than a year. The original well-marked tumor without dropsical effusion around it, the condition as witnessed by Dr. Peaslee and myself after the rupture; the distinctly marked tumor again after nature had disposed, by diuresis and other means, of a large portion of the fluid, six weeks later, showing it was not ascitic; then the description given by Dr. Finnell of the appearance of the abdomen when he tapped it; and finally, the fact that a large quantity of fluid was found by Dr. Emmet when he performed ovariotomy—all go towards proving this assertion to be correct."

Mr. Wells, in his work on "Diseases of the Ovaries," reports a case of rupture, where nineteen pounds of a calf's-foot-jelly-like matter, which had escaped into the peritoneal cavity, from a rupture of a multilocular tumor, was removed together with the tumor. The patient was already several days after the accident suffering from a low form of peritonitis, and died forty-four hours after the operation. But he has since saved the lives of several other similar cases by operating promptly.

The presence of ascitic fluid and a long existing peritonitis are closely connected, and furnish no special indication for delaying the removal of any coexisting ovarian tumor, although either condition alone, or both together, might influence the prognosis. It has been thought that the presence of fluid in the abdomen with a tumor was a certain indication of malignant disease. This, however, has not been borne out by observation, although malignant growths in the abdominal cavity are generally accompanied by more or less effusion.

Peritoneal accumulation takes place occasionally as a simple mechanical effect of the pressure of the tumor. The prognosis is affected by various circumstances, such as disease of the heart, liver, or kidneys, and especially the latter, as the renal excretion is often seriously diminished by the pressure of the tumor. Unless the growth is of a malignant character, the chances for recovery after its removal are favorable; the peritonitis will subside, and the accumulation can not again take place. When ovarian tumors have become the seat of papillary growths, peritonitis and ascites are sometimes caused by rupture of the cysts and the escape of the [illegible] It has been stated, when describing the [illegible] ascetic fluid, that such a condition of the [illegible] malignant. This opinion is based on the fact [illegible] to remain in good health for many years [illegible] appears, notwithstanding the peritoneum [illegible] time bathed in fluid filled with the [illegible] prognosis, however, is not so good in these cases [illegible] not been tapping [illegible] the operation for removal [illegible] simple ovarian tumors. The accompanying [illegible] constant drain which [illegible] elements.

[illegible] fluid is a great protection [illegible] adhesions. Therefore, when [illegible] making a diagnosis, it is [illegible] removed from the [illegible] performed immediately.

[illegible] in the abdomen [illegible] has, however, been [illegible] through the posterior [illegible] convenient point, but this method [illegible] made by Dr. Chadwick, of Boston [illegible] at a meeting of the [illegible] experience. "I do not believe that [illegible] the inflamed peritoneum [illegible] is nature's means of healing [illegible] and thus preventing adhesions [illegible] which might subsequently [illegible] If that effusion were drained of [illegible] bladder, intestines, etc., will [illegible] the mother, from which they [illegible] These remarks, however, do not apply [illegible] mother, are undergoing degeneration [illegible] therefore, likely to poison the [illegible]."

[illegible] circumstances, we are able to form [illegible] of adhesions previous to the [illegible] from the vagina to be [illegible] we may suspect that adhesions

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[illegible]

exist in this neighborhood. This supposition may be apparently confirmed by the immovable condition of the tumor, and yet no opinion based on physical signs could be more unreliable. It is rare at the present day for an operation to be abandoned on account of the adhesions, because it is well established that the woman's life will be placed in greater danger if the operation be left incomplete. The extent of the adhesions to the abdominal wall or omentum is deemed of little consequence. They only become serious when they exist between the tumor and the liver, bladder, uterus, or rectum. It has been generally held that extensive adhesions to the viscera, which are in constant motion, do not take place. This is true, as a rule, for the small intestines are rarely found involved, and the case which I have cited as having the stomach and colon so extensively adherent to the tumor, is, in all probability, unique. Adhesions to the bladder are to be regarded as the most serious. This statement is based on the fact that a degree of shock rarely met with under other circumstances, particularly where the lesion is so limited in extent, nearly always follows the breaking up of such adhesions. The adhesions to the abdominal walls are always to be torn from the surface of the tumor, but this method should never be attempted when they are situated elsewhere. If the tumor be found attached to the liver, intestines, or bladder, the adherent portion of the sac must be left undisturbed, as will be described hereafter. The walls of an ovarian cyst sometimes become agglutinated to a greater or less extent throughout Douglas's cul-de-sac along the posterior surface of the uterus, and it would be hazardous to separate them from either the rectum or uterus, since the hemorrhage would be great, and in a location where it could not be controlled. We have no other resource in such cases but to remove as much of the tumor as possible, and then attach the remainder to the lower angle of the wound, and this plan is the only one to be adopted with certain forms of fibro-cysts. This must, of course, seriously complicate the case, on account of danger of inflammation and blood poisoning.

A drainage tube should be placed in such a pouch, and when the cyst is adherent to the bottom of the cul-de-sac a permanent opening into the vagina below should be established, to facilitate the drainage. Under the most favorable circumstances the lining membrane of this pouch will remain for a time a pus-secreting surface. If an opening exists above, through the abdominal wall, and below into the vagina, favorable results would follow the injection of iodine and the frequent washing out of the cavity. I have lost, within a few months, such a case from tetanus, although it had been doing well for several days before the tetanic symptoms developed, and I have regretted that a counter-opening was not made into the vagina.

Dr. Sims[1] advocated, as a guard against blood-poisoning, the practice of establishing an artificial opening through Douglas's cul-de-sac into the vagina, for the purpose of draining the peritoneal cavity of the bloody serous effusion always thrown out after the breaking up of adhesions. The practice has, however, not proved an advantageous one, from the fact that the admission of air and the presence of the foreign body needed to keep the passage open excites a large amount of secretion, which would not otherwise occur. But the most important objection is in the exposure of the raw surfaces of the opening to being continually bathed by the fluid drained from above, thus subjecting the patient to a greater danger from absorption than would exist under ordinary circumstances.

Where extensive adhesions have been separated, and the oozing from the remaining raw surfaces is proportionately great, it is essential to provide some outlet for it. M. Koeberlé first used a glass tube pierced by a number of small holes, passing it to the bottom of Douglas's cul-de-sac from the lower angle of the abdominal section. Through this tube the fluid drained away and the cavity was washed out. Mr. Keith afterwards brought it more into practice, increasing the size of the tube and adding a rim, or flare, to prevent it from falling into the cavity. Dr. T. G. Thomas modified the shape of Keith's instrument by curving it somewhat in the central portion.

Dr. Peaslee[2] had previously practised washing out the peritoneal cavity with an artificial serum, through an opening left in the lower angle of the incision, which was kept closed by a linen tent. My experience has demonstrated that this method can only be employed to a limited extent. I have found after death that the exudations from peritonitis would become sacculated or break down and be encysted as pus, within a short distance of Douglas's cul-de-sac, where the force of the injections could not overcome the adhesions, or, if they did overcome them, would produce fatal hemorrhage.

The Size and Long Existence of the Tumor.—The size of the tumor does not complicate the operation, unless this is delayed until the kidneys or other organs have received some serious damage from long-continued pressure. The power of enduring the discomfort and pressure will, as has been stated, vary with the individual.

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[1] New York Medical Journal, 1872.

[2] American Journal of the Medical Sciences, April, 1863.

The history of the following case shows that this power may exist in a remarkable degree, and, at the same time, presents several important points of general practical interest.

CASE LX.—Mrs. S., aged 28, the wife of a subordinate officer stationed at one of the frontier posts, was admitted to the Woman's Hospital Nov. 25, 1869. The tumor had developed in eleven months, and in seeking relief she had ridden on the back of a mule for over a thousand miles to reach the nearest railroad. During her journey she suffered much from pressure against the pommel of the saddle, and the size of the tumor had rapidly increased. In stature she was below the average height, and when admitted was extremely emaciated, but the girth of her abdomen was over fifty-two inches at the umbilicus. The abdominal walls, below the level of the umbilicus, were corrugated and œdematous; the lower extremities were also infiltrated, and pitted readily on pressure. She seemed to be enormously distended by a multilocular tumor, which encroached so much upon the false ribs as to push them outward. The urine was examined, and indicated that the kidneys were in a healthy condition.

The operation was performed December 1st; present, Drs. Isaac E. Taylor, Post, Barker, and others. The abdominal incision was gradually extended to fourteen inches before the tumor could be separated from its adhesions, which literally involved the entire anterior abdominal parietes. The pedicle, which was broad, thick, and short, was secured with silver wire by the cobbler's stitch. The operation was tedious, owing to the extensive adhesions, and a delay occurred in attempting to check, by the application of the persulphate of iron and pressure, the oozing from an extensive surface on the abdominal wall, high up on the left side. It was, at length, arrested by having these raw surfaces held up together in a large fold, between the hands of an assistant, while I secured them in contact with silver wire, introduced by four cobbler's stitches. When this had been done, a fold or crest, about six inches long, was left parallel to the abdominal incision. This expedient was adopted on the spur of the moment, from observing the readiness with which the surfaces could be thus secured, while they were being held together for the purpose of making pressure. I employed the method afterwards, and did not learn for several years subsequently that Dr. Kimball, of Lowell, Mass., had for some time (how long I do not know) secured bleeding surfaces in the same manner. Mr. Wells also, as he states in his recently published lectures, had employed the same method for some length of time before he learned of Dr. Kimball's practice.

The incision through the abdominal wall was closed with interrupted silver sutures, and with difficulty. Notwithstanding the serum had been continually oozing from the œdematous tissues, their edges were still thick, and it was feared that the parts would not be properly adjusted when the oozing ceased. To provide against contingency the sutures were introduced at such a distance from the edges that a

recognize the danger of additional adhesions forming in some unusual manner or place, as a consequence of the displacement of the tumor by the enlarging uterus. These may be of such a character as to render the removal of the tumor afterwards impossible, as was the case with the patient in whom the stomach and colon became adherent to the tumor. Moreover, the lives of both may be lost if this undue degree of distension be permitted to continue when indications exist of functional derangement in the action of the kidneys, or of impaired nutrition elsewhere. The danger of rupture of the tumor, and the consequences to both mother and child, must always be considered in advanced pregnancy, and finally the evil effect of a tedious labor upon the child, even if the mother should escape, should be remembered.

If the tumor be unilocular, tapping should be resorted to for temporary relief. But should it be multilocular, and the case, as described above, be an urgent one, the tumor should be removed without delay, in the interest of the mother. Fortunately when the operation is done before uræmic symptoms have became marked, the recovery of the mother will not be complicated necessarily by the existing pregnancy, and the probabilities will be good for the future progress of the gestation to a favorable end.

Mr. Wells has operated ten times, where pregnancy existed, for removing ovarian tumors, having but one death, all the others recovering and going to full term. He has been successful also in removing a tumor without affecting the pregnancy, where peritonitis already existed as a consequence of rupture of a cyst, and the escape of its jelly-like contents into the peritoneal cavity.

Dr. Sims removed, in 1860, a very large unilocular cyst, without adhesions, from a private patient, between the third and fourth months of pregnancy. I had charge of her after the operation; the pulse never rose above ninety per minute; she recovered without a bad symptom, and had three children afterwards.

Dr. W. L. Atlee also operated on a case under the same circumstances, and without any bad consequences.

Dr. Playfair has collated (Peaslee) fifty-seven cases of this complication, in thirteen of which the mothers were lost; in seven cases where the cyst was punctured, they all did well, and gestation was not interrupted. Dr. Braxton Hicks cites eight instance of ovarian tumors complicated with pregnancy which went to full term, and were delivered of living children.

Cancer, Phthisis, Diseases of the Kidneys, etc.—We may be able to recognize the existence of cancer by microscopic examination, but we can form no estimate as to the extent of adhesions, in a knowledge of which must rest the advisability of attempting to remove the mass. Therefore, in every instance, after withdrawing the ascitic fluid, the abdominal incision must be enlarged sufficiently for the purpose of gaining this information. The patient must always have the benefit of the doubt, since she can have but a very limited future if a growth of this character be left undisturbed, while it is a well-admitted fact that she may gain a new lease of life, for an indefinite time, if certain growths are thoroughly removed, which might in time become malignant in character. Should the appearance of the patient indicate the cachexia, so characteristic of the advanced stages of malignant disease in other parts of the body, the operation for removal should not be attempted. We may prolong life by tapping, but more than this should not be attempted, for the nerve centres are already poisoned by the condition of the blood, and the patient is consequently unable to react from the slightest shock.

Phthisis is fortunately not a common complication, although it may exist in a certain proportion of cases, and its origin may be in some way related with the development of the tumor; but the coexistence of the two is usually a coincidence. In the early stages of the pulmonary trouble, the deposit of tubercle may be at least temporarily arrested by removing the ovarian tumor, so that the pulmonary circulation may be less obstructed. In the advanced stages of the disease, no other benefit can be hoped for from any operative procedure beyond relief to the breathing, and when this can be obtained by tapping, it should be employed.

The Condition of the Kidneys is a most important matter in ovariotomy, for on their even more than usual activity depends a favorable termination in every case, unless it be unusually simple in character. Any functional disturbance of them will be relieved by increased action of the skin, and will entirely disappear after the removal of the tumor. But if advanced organic disease exists, we must be prepared, in all probability, for a fatal termination of the ovariotomy. I am confident that I have lost a case after removing the tumor, in consequence of disease of the kidneys, their action having been entirely arrested in the effort to eliminate the ether. We should always be on the lookout to prevent the kidneys from being over-worked, and endeavor to relieve them by inducing an increased action of the skin and bowels.

When other organic diseases complicate ovarian tumors, we must determine in each individual case the propriety of operating, or of gaining temporary relief and time by tapping.

Uterine Fibrous Tumor.—This complication is not common. I have met with but a single instance, the one referred to by Dr. Peaslee in his work (page 97). In this case ascites also existed, and it was necessary to tap before the diagnosis could be fully formed. Dr. Peaslee states that he had met with several instances. As long as the two tumors (ovarian and uterine) are but moderately enlarged, it is not difficult by means of a sound in the uterus to judge of their mutual relation. If in operating, the abdominal section be made sufficiently large, the presence of the uterine growth will scarcely add much to the difficulties of removing the ovarian tumor. If the complicating uterine tumor were a fibro-cyst instead of a fibrous growth, it would be somewhat likely to become pedunculated by the pressure of the ovarian tumor, sufficiently to admit of its removal also.

Disease of the Remaining Ovary.—It is not uncommon to find a tumor in each ovary in different degree of development. Koeberlé found both ovaries involved in nearly one-fifth of all of his cases, a somewhat larger proportion than is found by other operators. But all have met with a certain number, and it seems to be the general experience that double ovariotomy does not materially increase the risk of the operation.

CHAPTER XLII.

GENERAL DETAILS IN OVARIOTOMY.

Proper time for operating—Preparatory treatment—Instruments—Preparations for the operation—Mode of treating the pedicle.

Proper Time for the Operation.—No inflexible rule can be laid down as to the proper time for removing an ovarian tumor. Each case is a law unto itself in this respect, to determine which a ripe experience and a careful judgment are essential. Some women suffer more at an early stage than others do later, even when there is a considerable degree of distension. Some bear the suspense badly, and their anxiety of mind tends so greatly to impair their physical condition that an early operation is imperative. In general terms surgical interference should be delayed until, as has been stated, it becomes evident that the general system is beginning to be affected, as indicated by loss of flesh about the neck and upper part of the chest, by disturbance of digestion, and by more or less obstruction to the action of the lungs and heart. A judicious delay enables the peritoneum to become more tolerant to irritation and much less liable to inflammation than it would be were the tumor removed at an early stage of its growth. On the other hand, the patient may be deprived of all chances of recovery should the removal be delayed until the vital powers become so much depressed that she cannot react from the shock of the operation. The best results then may be expected as soon as the patient has been toned down, or physiologically adapted, as it were, to the operation, and success will be the more certain if she is buoyed up by a firm assurance of recovery.

Preparatory Treatment.—It is very important to bring about a healthy action of the bowels, skin, and kidneys previous to operating. The long-continued pressure of the tumor induces a greater or less accumulation of feces, which should be removed as well for the comfort of the patient as for the success of the operation. The means to be employed for the removal of the scybalæ will also remove the flatus. Without this preparatory treatment the operation is often rendered more difficult of execution, and the ultimate success more uncertain. Whenever the intestines are distended by flatus, it is almost impossible to keep them within the abdominal cavity during the operation; moreover, any increase in their bulk, by distension, may render it difficult to make any inspection that may be necessary for detecting the source of bleeding. The comfort of the patient also, after the operation, may be diminished by flatus in the bowels, and if the pedicle is short, and has been secured in the wound by clamp or stitch, it may be so much displaced as to bleed, or so much irritation may be established as to excite peritonitis.

A proper condition of the skin tends to insure a healthy action of the bowels, kidneys, liver, and lungs, which will render the circulation in the capillaries more active and thus diminish the risk of inflammation and blood-poisoning. My experience leads me to believe that a certain proportion of cases suffer from peritonitis, and possibly septicæmia, after the operation, because the action of the skin has not been previously attended to.

The influence exerted on the other organs by a healthy action of the skin is a fact too well established to need any further discussion. It is, therefore, evident that, if the skin be inactive, the elimination of any new poisonous material resulting from the operation will be greatly lessened. During the progress of ovarian tumor the circulation tends to become so imperfect in the capillaries that, even under the most favorable circumstances, the skin is, as a rule, dry and inactive. Hence I always address my treatment first to the skin, and find that the bowels are thereby more easily acted on afterwards.

A steam bath is the most beneficial in its effect, and where this cannot be obtained a hot-water bath may be given. After the body has been well washed with soap, and dried, the skin, particularly of the extremities, must be rubbed thoroughly by the hand smeared with vaseline. The body should be wiped off with a piece of soft flannel, so as to remove all excess of grease, some hot diluent drink administered, the patient then covered up warm in bed to increase the action of the skin, and to obtain rest by sleep. This process might be gone through with for several nights just previous to the operation, or employed two or three times a week if there should be no urgency in the case.

Whenever the condition of the patient will admit of it a brisk cathartic should be administered, with the view of unloading the portal system. Podophyllin often answers well for this purpose, and its irritating effects may be generally counteracted by combining with it a small quantity of the extract of belladonna. But I employ a combination of calomel and soda more frequently than any other purgative, following it by several doses of castor oil, which is the most reliable of cathartics when the strength of the patient is much reduced.

Without regard to the special cathartic employed, it will always be beneficial to administer one or more enemata of hot water and inspissated ox-gall, the patient being placed on the knees and elbows, after the manner already described. Thus given these enemata distend the colon and constitute the most efficient means at our command for removing both scybala and flatus.

As recommended by the late Dr. Peaslee, the patient's diet should consist chiefly of milk porridge for several days before the operation. This is made by boiling for an hour, equal parts of milk and water, thickened with flour, with the addition of salt in preference to sugar. It has been found that this diet does not distend the intestines with flatus, and that under it the patient suffers less from fecal accumulation. When meat is needed, thick and tender lamb rib chops, just cooked through, and not under-done, answer well, as they are more easily digested than any other meat except that from the breast of game birds. It is advisable that the diet of the patient, for several days before the operation, should be of the simplest character consistent with the maintenance of her strength. To insure the best physical condition for the operation it will be necessary for the patient to obtain undisturbed rest during the previous night, and to guard against the ill effects of over-anxiety an anodyne should always be administered. About noon, or shortly afterwards, the patient will be found in the best condition for the operation. Some three hours should have elapsed after taking food before administering the anæsthetic, and if in the mean time it be necessary to sustain the patient, a little beef-tea and brandy should be injected into the rectum.

At the time of the operation the patient should be clothed in a flannel shirt and drawers, a night gown and stockings. As the last thing before entering the operating room the patient should empty her bladder.

It is all-important in this, as in any other capital surgical operation, that the day selected should be bright and clear, with a westerly wind, for our portion of the world. A cold, raw, and easterly wind will sensibly affect the nervous system of any healthy organization, and may cause the death of a patient when in a feeble condition. The depressing effects of an easterly wind, ladened with moisture, will be well marked on the nerve centres of a feeble organization, rendering reaction from the shock of the operation difficult. Whenever the patient is feeble, I never hesitate to postpone the operation to a more favorable day, unless reasons exist which render delay inadvisable.

A room with the windows having a southerly or westerly exposure is best fitted for the operation; its temperature must be kept at 80° throughout the whole time.

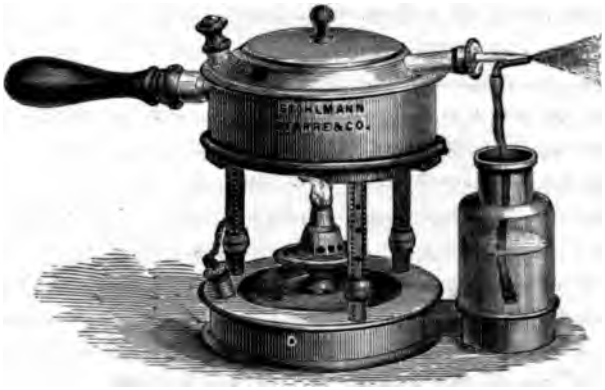
A table similar to the one for ordinary examinations will answer for the operation. It should be covered in the same manner by several blankets, and over all a sheet of India-rubber cloth. Several pillows are needed. The operating table must be placed near the window, so that the lower limbs of the patient will be in that direction, leaving space enough for a small table, to be used for the instruments, and for the assistant to stand in charge of the spray apparatus.

The number of instruments recommended for this operation is most formidable, but the essentials, in addition to the ordinary gynæcological case, are very few. A scalpel, a few pairs of forceps for seizing bleeding vessels, a grooved director, a trocar having several feet of tubing attached, vulsella for drawing out the sac, a clamp for securing the pedicle, a cautery apparatus, sponge holders, various scissors, a glass drainage tube, needles, and the usual instruments for applying silver sutures. All these should be thoroughly cleansed and placed on the table in a shallow vessel containing some disinfecting fluid. A number of large, straight sewing needles, like those used for the perineum, should be threaded with a short loop to which the silver wire must be already attached. Several silk ligatures of sufficient strength, but not too large, should be prepared for the pedicle, if to be secured by this method, together with a number of ligatures for securing bleeding vessels. All of these should be placed together at some convenient point, and under the special charge of an assistant. A number of pieces of linen with the edges hemmed, and about eight inches square, should be provided and placed in a solution of carbolic acid. These are to cover the tissues as they are handled; they were first used by Koeberlé.

It is of sufficient importance for the operator himself to examine carefully the sponges. They should be fresh sponges carefully selected and prepared for the operation. All portions of shell or other foreign matter must be first carefully picked out, and the sponges well washed with soap and thoroughly boiled for some time. It is well to expose them for several days to the action of the sun, pick them over again and finally wash them in a hot solution of carbolic acid; they may then remain until used in a weak solution of the acid.

A spray apparatus, or better two, should be selected with a sufficient capacity to remain in operation for at least two hours without needing to be replenished. A number of these have been devised in this country, more or less on the plan of Lister's original instrument. The modifications by Drs. Weir, Thomas, and Hanks are in more general use, and each has some special point to recommend it.

Fig. 123.



Weir's steam spray apparatus.

[1]Three solutions of the carbolic acid will be needed, and that for the spray apparatus should be made from absolutely pure phenol, as it is found to be more soluble and less irritating. The first solution should be in the proportion of 1 to 40, to be used for the protective and the gauze covering. The second solution for the spray should be 1 part to 30, and the third solution 1 to 20. The latter solution will be of the strength needed for purifying the sponges and all the instruments, and they should be allowed to remain in it for at least half an hour before commencing the operation. It is yet a question to be determined by experience, if other agents, less irritating and at the same time as effective, can be used in the place of the carbolic acid spray. Salicylic acid has been used in the proportion of 1 to 300, but it has no advantage over the thymol solution which is unirritating; but this has yet to be subjected to further test, and its

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[1] To Dr. Robert F. Weir, I am indebted for all my knowledge on this subject, obtained either by personal instruction from himself, or from his paper "On the Antiseptic Treatment of Wounds and its Results," New York Medical Journal, Dec. 1877, and Jan. 1878, to which I refer the reader for more general information on the subject.

greater efficacy proved before the carbolic acid is to be abandoned for it.

The formula used at the Woman's Hospital for preparing the thymol solution is fifteen grains of thymol to three drachms of alcohol, half an ounce of glycerine, and thirty-four ounces of water. The directions are to heat the alcohol until it is hot, dissolve the thymol in it, and then add the glycerine and water.

The tissues constituting Lister's dressings are, antiseptic gauze, a coarse cotton fabric, known in commerce as cheese cloth, carbolized by a certain process; some mackintosh or thin rubber cloth to cover the abdomen, some oil silk, which has received a thin layer of varnish on one side through which the carbolic acid cannot penetrate, and called the protective; and a quantity of carbolized jute. The ligatures, whether of silk or catgut, should also all be carbolized.

Six assistants will be needed, and the spectators should be limited in number.

A warm blanket should be spread over the lower end of the table, with which to envelop the legs and feet of the patient as they hang over to rest upon a chair. Her nightgown and undershirt should be rolled up to a point at which they cannot become soiled. A small pillow should be pushed under the middle of her back for support, and the other pillows so placed at an angle as to make her position comfortable. The operator will select the side of the patient on which he is to stand, according to the direction of the light, or as he may have a preference. He will then need an assistant to stand between him and the instrument table, but just behind him, so as not to obstruct the light or spray. His chief assistant will stand on the other side of the operating table opposite to him, ready to sponge when necessary. A third person may stand at the side of the chief assistant nearest the patient's head for the purpose of keeping up steady pressure, while the tumor is being emptied. This he does by applying his open hands flat on each side of the abdomen. Afterwards he may be needed to assist the person giving ether, and to look after the condition of the patient, and to give hypodermic injections of brandy, if they shall be needed. The person administering the anæsthetic should be particularly skilled therein, and so familiar with the operation that he may not neglect the anæsthesia in his anxiety to witness it. The operator should on no account have his attention called from the work before him. The fifth assistant should have charge of the spray apparatus, and the sixth one is to wash the sponges. The assistant with the spray should stand by the window on the side of the instrument table opposite to the operator, with a rest for the apparatus, so that the spray may be directed obliquely along the line of the incision and just over it, avoiding the patient's face.

As the patient passes under the influence of the ether, a folded napkin should be placed between her knees, the legs tied together and secured, if necessary, to the back of the chair, or better to the table. A piece of oiled silk four feet long and not quite so wide should be placed over the bare abdomen. From the centre of this a circular piece, sufficiently large, is to be removed, and the edges of the oiled silk, to the width of an inch or more, spread with the material for forming an adhesive plaster. This opening will expose a sufficient portion of the abdominal wall to allow the operation to be completed. As the edges of the oiled silk are adherent all around, the clothing below will be protected, as well as a portion of the patient's body. A large receptacle must be placed under the table for receiving the contents of the tumor, and alongside of it a small hand-bowl, to be used for the same purpose when more convenient. Near by must be placed a supply of towels and a basin of warm water, in which the operator may dip his hands from time to time, and it should be the duty of some one person to change frequently the water during the operation. Before beginning the operation it must be seen that in front of the fire, or heating apparatus, have been placed several blankets, a change of clothing for the patient in case she should need it, and a sufficient supply of hot water. The patient's bed must also be properly prepared. [illegible] should be narrow, that the patient may be readily [illegible] the mattress should be of hair, and hard, protected by a [illegible] and [illegible] by a [illegible] and cotton sheet for the patient [illegible] of the bed a number of vessels [illegible] and covered up by the [illegible]

[illegible] it remains for [illegible] the operation. The most im- [illegible] thoroughly cleansing his hands, [illegible] under the nails [illegible] with hot water and [illegible] however, the chief assistant, [illegible] the sponges, and any one who [illegible] the sponges or instruments, or [illegible] should cleanse and disinfect his [illegible].

[illegible] the Pedicle.—In order to avoid repetition, and not [illegible] in our description of the operation proper, we will

first consider the different modes of treating or securing the pedicle. The best method is still an open question, but, if the operator has no preference, it is determined somewhat by the character of the pedicle, the choice lying between the use of the clamp or ligature, and possibly, the cautery, under certain circumstances. Sometimes the tumor is enucleated in the absence of a pedicle. In general terms it may be stated that the use of the clamp is to be restricted to a long pedicle, and the cautery to a narrow one with small vessels. The ligature, in all probability, will become in the future the means generally employed for securing the pedicle. For a number of years I have used the silk ligature exclusively for this purpose, and have dropped the pedicle back into the abdominal cavity, although I had been previously opposed to the practice. The opposition to the ligature was based entirely on theoretical views: I feared that the silk would act as a foreign body and lead to the formation of abscesses, but experience has disproved this.

In my first operations I ligated and attached the pedicle in the lower angle of the wound, as had been recommended by Langenbeck, and afterwards by Dr. H. R. Storer. Then I employed for a short time the clamp, which proved in my hands the least satisfactory method for treating the pedicle. For several years afterwards I secured the pedicle by means of silver wire introduced like a shoemaker's stitch.

Dr. Peaslee in his work, page 442, credits Dr. Murray, of the Great Northern Hospital, London, with having proposed, in 1865, the application of a ligature to the pedicle in the form of the figure 8, and states that "Dr. T. A. Emmet reported his use of the silver wire in the same way in 1870" (*Am. Journ. of Obstetrics*). This is an error, as I seldom used the figure-of-8, but took at least three stitches, and the number could be extended indefinitely, like cobbler's stitches, while Dr. Murray's purpose was simply to secure the pedicle, by silk or any other means, in two sections.

I used a somewhat larger wire than that generally employed for surgical purposes, and in sections about a foot long, with a large straight needle attached at each end, the wire being twisted through the eye.

While an assistant held up the pedicle, so that the light might be transmitted, I selected a spot clear of vessels, through which I passed a needle, and from the other side another needle, along the same tract, but in opposite directions. This was repeated at short distances and the intervals between the stitches were compressed by tightening the wires. The pedicle would be thus included in three or four sections, according to its size, and the ends of the wires were twisted and cut off. At each section, in turn, the wire was tightened, but before being twisted, the stump of the pedicle was seized by the operator, between the thumb and fore-finger, and traction was made first on one wire and then on the other. If traction were made on both ends at the same time, only one section would be compressed, for the suture would bind where the wires crossed. But with traction on one at a time the wire would be drawn straight so that the tissues could then be easily run together, as it were, or compressed between the fingers, and then the other wire could be drawn up in the same manner. The ends were twisted, bent flat and cut off, with the twisted portion about an eighth of an inch in length. The wire when thus used remained so imbedded in the tissues and covered by the stump as to be hidden, where it became encysted and caused no irritation afterwards.

I used a temporary clamp, placed generally next to the uterus, and, that the tissues should not be bruised, I employed one made on the principle of that used with Chapman's India-rubber ice bags, in which simple, round, and flat surfaces are brought together. Then just before the ends of the wires were twisted, but while in the grasp of the forceps, the clamp was always carefully loosened. If bleeding then took place, the wires were drawn tighter, while the escape of blood could be easily controlled by the grasp of the fingers.

If oozing should occur from one particular section, after the ends of the wires have been secured, it is easy to tighten that portion by hooking a tenaculum under the wire, and giving it several turns upon itself. This suture should be placed as near to the uterus as can be done without causing undue traction, and with the purpose of leaving the stump clear for an inch or more beyond the constricted portion. If this precaution be neglected and the tissues are trimmed too close to the suture, the portion of pedicle within the grasp of the end loop may be pulled out by the traction, and the patient die from loss of blood.

I am ignorant of any other means for securing the pedicle, except the clamp, which can compress the tissues within so small a bulk as can be done with the cobbler's stitch. I secured the pedicle in some fifteen cases by this means, and with a single exception, where I cut the tissues too close, I was fully satisfied with its use. In this case it was found, after death, that nearly a pint of blood had been gradually lost, during some three days, from a portion of the pedicle which had slipped from the end loop. If the hemorrhage had not been the immediate cause of death, which was probably the case, the consequence would have been serious, if the patient had ever reacted. I had been closely watching Dr. Peaslee's practice for some time, and finding that his results were good from the use of the silk ligature, I abandoned the silver wire. Yet there are conditions where the cobbler's stitch might be employed with great advantage for bringing surfaces together about the pelvis, and when an interrupted suture cannot be applied with accuracy. It can be used in vascular tissue with more safety than any other suture, and even if the stitch should pass through the centre of a large vessel, the bleeding would be arrested by the compression exerted on all sides. The silver wire becomes so thoroughly encysted that, when death occurs after a week, it is exceedingly difficult to find it.

In some respects iron wire, even of a smaller diameter, might be preferable on account of its strength, and from the fact that the iron may, in time, become oxidized and be absorbed.

Dr. Nathan Smith, of Connecticut, in 1821, according to Dr. Peaslee, was the first to ligate the vessels of the pedicle, to then cut the ends of the ligatures short, return the stump, and close the external wound. Dr. D. L. Rogers, of New York, in 1829, and Siebold in 1846, followed essentially the same plan of operating. Dr. W. Tyler Smith, of London, as late as June, 1861, adopted the method, and in consequence of his connection with giving it prominence, the plan of practice is generally associated in England with his name.

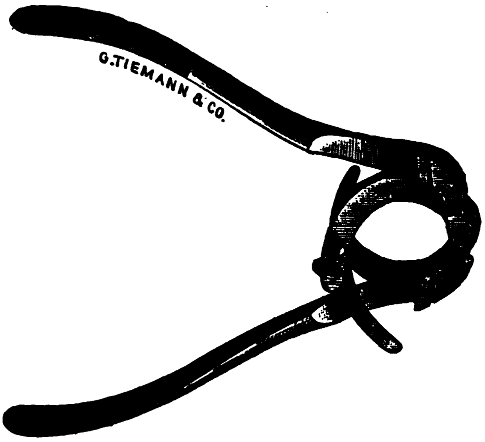
The pedicle has also been ligated by means of carbolized catgut, which has been recommended not only on account of its antiseptic properties, but from the fact that it is rapidly absorbed and will disappear within a few days. But in this property lies the danger from its use, since death has occurred in consequence of hemorrhage where the ligature has been absorbed before the vessels have become obliterated. This material cannot be tied in so compact a knot as silk, and has no advantage, for the silk also in time disappears.

The clamp was first adopted by Mr. J. Hutchinson, of London, in 1858, and his first instrument was the carpenter's caliper compasses, which he afterwards improved by removing the handles. This instrument was at one time the favorite means for securing the pedicle, but it is now seldom employed. It has, however, always been the favorite means used by Mr. Spencer Wells, and the endorsement of the value of the instrument by one who has already removed more than nine hundred ovarian tumors demands for it more than a passing notice.

There are two great advantages in the use of the instrument—bleeding from the pedicle cannot take place without being detected, and no foreign body in connection with the pedicle is left within the abdominal cavity. On the other hand, unless the pedicle be a long one, the patient suffers in consequence of the traction exerted when the abdomen becomes distended by flatus. To this irritation can be traced the occurrence of peritonitis, as I have frequently thought. The objection has been advanced that this binding down of the uterus would have a bad result in a future pregnancy. This, however, cannot be a permanent condition, for I have often seen pregnancy advance without causing any apparent traction to be exerted on the uterus. It has also been held that there is a danger of the intestines becoming strangulated by this band.

Mr. Wells has modified, from time to time, the shape of the clamp, but Fig. 124 shows the one at present used by him, from which the handles can be detached, leaving but a ring around the stump of the pedicle. Koeberlé also uses a circular constrictor, or clamp, which acts very much on the same principle as the one used by Mr. Wells.

Fig. 124.

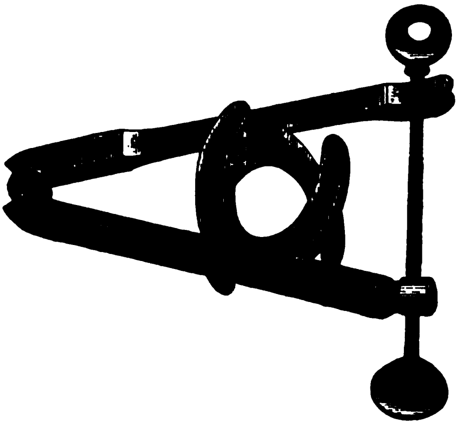


Wells's clamp for the pedicle.

The instruments chiefly used in this country are Wells's, Thomas's, Dawson's, and Atlee's clamps, each having some special feature to recommend it. I prefer that of Dr. Thomas.

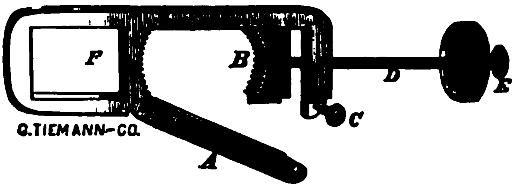
The use of the actual cautery at a red heat, for dividing the pedicle, was first practised by Mr. Baker Brown, of London; although to Mr. John Clay, of Birmingham, is due the credit of the conception, since he first employed the method for dividing adhesions. The practice is not now employed as formerly, and, to-day, it is chiefly advocated by Mr. Keith, of Edinburg, Prof. White, of Buffalo, and, I believe, by Dr. Sims. As Mr. Keith has been successful in saving a larger proportion of his cases than any other operator in the world, this special mode of practice becomes entitled to a value which it would not otherwise possess. Mr. Baker Brown was obliged to resort frequently to the use of the ligature, although to the cautery was given the credit of controlling the bleeding. What Mr. Keith's practice is in regard to the additional use of ligatures, I do not know. From a somewhat limited experience of the cautery I must confess to a feeling of mistrust as to its safety. But if the precaution be taken to tie separately the larger vessels, I believe that in many cases the use of the cautery for dividing the pedicle would prove an excellent mode of practice.

Fig. 125.



Thomas's clamp.

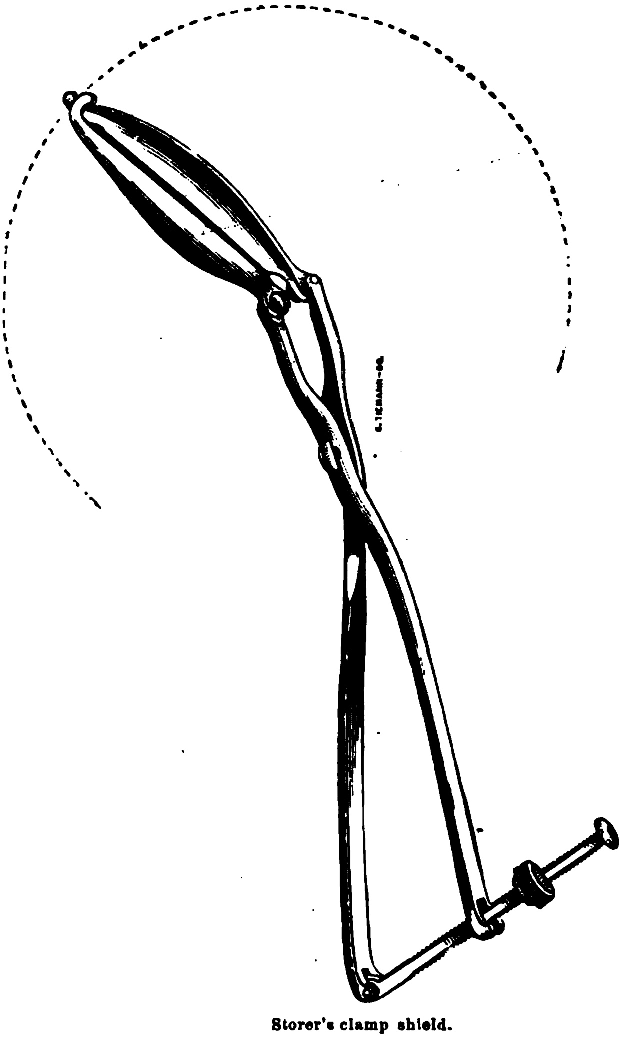
Fig. 126.



Dawson's clamp.

In the United States those who had operated the greater number of times were divided between the use of the ligature and the clamp. The late Dr. Atlee, who removed a larger number of ovarian tumors than any other operator in this country, almost always used the clamp; Dr. Peaslee, always the ligature; and, I believe, also Dr. Kimball, of Lowell. Dr. Thomas has a decided preference for the clamp, and Prof. White is the only one known to me now, in this country, who advocates the use of the cautery.

Fig. 127.



Storer's clamp shield.

Whenever the cautery is employed, its value will rest upon the use of a temperature so far below white heat that the tissues can only be separated slowly, so that they may be changed in character for some distance beyond the actual contact of the iron. There will be no fear of sloughing, but this will alone insure the destruction of all but the largest sized bloodvessels, which must be ligated, as a rule.

In connection with the subject of securing the pedicle, reference must be made to Dr. H. R. Storer's "clamp shield," which is an excellent instrument to be used as a temporary clamp. For the removal of the uterus, or for securing tissues deep in the pelvis, we have no other device so well adapted.

There are certain conditions, viz., absence of the pedicle, too short a pedicle, and the existence of adhesions close to the attachment, which render it advisable to enucleate the tumor, as suggested[1] and first practised by Dr. J. F. Miner, of Buffalo. In a case where the cyst was generally adherent he succeeded in separating so extensively the layers of the cyst wall as to free the tumor.

It is recommended to belt the tumor by a somewhat superficial incision at a distance from the pedicle, and then attempt to separate the tissues so as to loosen the tumor from its connection with the pedicle until it becomes free.

Dr. Miner states that "the pedicle was large and extended over a wide surface, but by gentle and patient efforts, it was separated from its entire attachment to the tumor, and the immense growth removed without the ligation of a single vessel. The terminal branches of the vessels of the pedicle gave out no more blood than issued from the vessels of the attachment elsewhere, and there appeared no more occasion for ligature here than elsewhere."

Dr. Miner has practised this method in a number of cases, as have Prof. James P. White, of Buffalo, and others. I have found, in some cases, the cyst walls in such a condition that no such separation could be made, while in others it could be accomplished with facility. I have never had a case in which it was necessary for me to follow this plan of enucleation.

During the meeting of the Obstetrical Section of the Am. Medical Association, in 1876, Dr. Alex. Dunlap, of Springfield, Ohio, proposed[2] what he called a division of the pedicle.

The tumor is first to be freed from all adhesions and lifted from is tied, and the pedicle secured in a temporary manner to prevent bleeding. Then a cut is to be made around the tumor, about half way through, and at such a distance that enough of the peritoneum may be saved to form a long pedicle. After doing this, the next step is to enucleate the tumor in the same manner as practised by Dr. Miner, of Buffalo. This leaves the bottom of the cup-shaped wound resting on the broad ligament of the uterus. He directed that, after securing the vessels, from five to six long loops of silk should be passed through the cut edge of the peritoneum, at equal distances. Then a curved metal speculum was to be introduced into the vagina to one side of the uterus, but never in front or behind it, and as the instrument was being pushed up against the bottom of the wound, a small opening was to be made.

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[1] Buffalo Med. and Surg. Journ., June, 1869.

[2] Medical Record, July 8, 1876.

Through this opening were to be passed into the vagina all the silk loops from the edge of the peritoneum, and the ligatures for securing the vessels, down through the speculum to the vaginal outlet. Then a traction was made on these loops, the detached peritoneum became inverted, and thus the raw surfaces were brought together in close contact.

By this method no discharge from the site of the pedicle could enter the peritoneal cavity, and the ligatures after becoming detached could be withdrawn through the vagina. Dr. Dunlap suggested that a similar plan might be followed in the removal of fibroid tumors.

This plan resembles in many respects the one adopted by Prof. Freund, of Strasburg, by which he removed in five instances the uterus [illegible], two [illegible] surviving the operation. I am unable to determine to whom the credit of priority is due for this method of inverting the peritoneum, and thus bringing together the denuded surfaces, and [illegible] the ligatures through the vagina.

[illegible] Freund also recommends the procedure for the removal of [illegible]. We will not enter into the merits of this operation [illegible] more than question if any [illegible] can possibly be derived. But [illegible] a fibrous tumor of the uterus, instead [illegible] necessary to complete the operation [illegible] the method may be followed with advantage [illegible] would be, in all probability, not [illegible].

After a temporary ligature has been passed around the tumor to [illegible] the bleeding, it is recommended to tie the vessels in the broad [illegible] each side. Then the mass may be removed and the stump of the uterus separated from the connective tissue about it, and freed from its attachment to the vagina. When this has been done the surfaces are all doubled on themselves, and drawn down by the ligatures to the opening into the vagina.

Then, to cut off all communication with the abdominal cavity above, the edges of the peritoneum and other tissues, are brought together by a whip-stitch across the opening into the vagina.

A more extended description of this operation, with several diagrams, will be found in Mr. Wells's lecture, published in the *British Medical Journal*, July 27, 1878.

CHAPTER XLIII.

ABDOMINAL OVARIOTOMY.

Steps of the operation—After-treatment: antiseptic dressings; closing of the incision; reduction of temperature (quinine, cold water applications, "fever cot").

Steps of the Operation.—The incision in the abdominal walls has sometimes been made through the muscles directly over the seat of the diseased ovary, but there seems to be no special advantage in this, and now it is almost always made in the linea alba. The location of this line can be easily traced by the eye from the symphysis pubis to the umbilicus, and frequently, in ovarian disease, a dark line in the skin marks the course of the linea alba beneath.

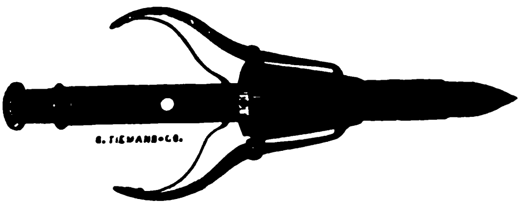
The first incision is to be made in this line, between the two recti muscles, about an equal distance from the umbilicus at one end, and from the pubes at the other. After cutting through the skin, the connective tissue, and a greater or less thickness of fat, the abdominal fascia will be brought into view, and this must be laid open on a grooved director, as the peritoneum is immediately below it. This in turn should be carefully opened by catching it up with a pair of forceps, snipping a small opening for the introduction of the grooved director, and then dividing it with the scalpel or scissors. The incision at first should not be more than three or four inches in length, and the progress of the operation should be slow, so that each bleeding vessel may be either tied, or secured by a pair of forceps before opening the peritoneal cavity. As soon as the surface of the sac has been exposed, it will be readily recognized, while yet moist, as has been stated, from its peculiar pearl-like hue. Whenever it is dark and vascular from being covered with unusually large vessels, this is generally indicative of a fibro-cystic tumor of the uterus.

When the sac has become firmly adherent to the abdominal walls, it is sometimes impossible to recognize the peritoneum. In the attempt to separate the supposed adhesions, this membrane may be extensively torn off from the muscular tissue, and there may be considerable hemorrhage before the true condition is detected. This may lead to much trouble afterwards, and to avoid it we must proceed with care until the tumor has been reached, and even if it be punctured by accident it can be safely emptied before the adhesions are broken up.

Under ordinary circumstances it is desirable to have some idea in regard to the extent of adhesions before evacuating the contents of the tumor. This is ascertained by introducing, through the small abdominal incision, a large steel sound, as made for the male urethra, or a block tin rod (which I prefer), the instrument being carefully passed in every direction over the surface of the tumor. If it is evident that adhesions exist to any extent, it will be necessary to introduce between the tumor and abdominal walls, two fingers as a guide, and with a pair of scissors extend the incision, passing upwards to the left of the umbilicus, or beyond, if necessary, and downwards to the pubes, care being taken to avoid injuring the bladder.

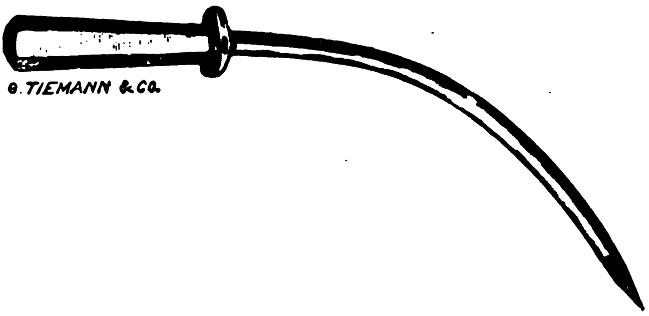
Trocars of various forms have been devised for drawing off the contents of the sac. Wells's trocar is much used. It has an arrangement for seizing the walls of the cyst and drawing it out as it becomes emptied. Fitch's "dome trocar" has been enlarged for this purpose; its principle admirably fits it for tapping the cavity of the pleura or

Fig. 128.



Wells's trocar.

Fig. 129.



Emmet's trocar.

pericardium without wounding the lungs or heart, but it possesses no special advantage for emptying an ovarian cyst which is exposed to view. I prefer a simple curved trocar and canula about five or six inches in length, which I had made many years ago, and still continue to use (see Fig. 129).

The operator will select some point free from bloodvessels, in the largest sac (if there be more than one), through which to plunge the trocar and canula. Unless the tumor is free from adhesion, so that it can be drawn out to prevent the escape of fluid into the abdominal cavity, it should be tapped with the patient on her side, as first recommended by Mr. Wells. The patient can be turned well over on the side, and be thus held by the assistants, while the operator gradually draws out the sac by means of any strong forceps or vulsellum constructed for the purpose. A linen cloth must be placed under the tumor and over the lower edge of the wound, to receive any cystic fluid which might by accident escape alongside of the canula, otherwise it may enter the abdominal cavity. As the abdominal walls become more relaxed, the upper edge of the incision should also be covered by a linen cloth to protect the parts, and to keep the hand of the assistant from coming in direct contact with the intestines, which are liable to protrude.

The most frequent seat of the adhesions is to the abdominal walls, and next to the omentum, covering the anterior surface of the cyst. They may be found in both places.

Great care and skill are required to separate the adhesions between the tumor and the abdominal walls. This separation must be made, as has been stated, by tearing off the adhesions from the surface of the tumor, and never from the abdominal wall, as this would leave the muscular tissue exposed without any peritoneal covering, which would delay and complicate the progress of the operation. But when the adhesions are separated from the surface of the tumor, it rarely happens that any large bloodvessels are lacerated, and what capillaries are torn will promptly close up.

If the omentum, as indicated by its appearance, is found to be adherent to the tumor at the abdominal opening, more care must be exercised in making traction, through fear of tearing the connection of the omentum with the intestine beyond. It is not necessary to delay for the purpose of attempting to separate the omentum from the surface of the tumor, but just beyond the adhesions two ligatures may be placed, an inch apart, around the mass, which may then be divided between the ligatures with a pair of scissors. This will prevent any bleeding from the tumor, and the ligature from the end attached to the omentum should be placed in charge of an assistant while the stump is temporarily returned to the abdominal cavity.

Adhesions are sometimes formed with the under surface of the liver, and to the stomach and small intestines. If these are carelessly broken up, the substance of the viscera may be torn, and fatal results follow. When slight they may be separated from the surface of the tumor; but the safest plan is to cut around the adhesions so as to leave the adherent part of the cyst wall intact, and then carefully strip off the portion of lining membrane. If a vessel be divided it must be secured with a fine silk ligature.

Dr. Peaslee states that adhesions to the stomach are never found, although Kiwisch admits them. After Dr. Peaslee wrote his work, however, he was present at an operation begun by me in the Woman's Hospital, in which both the stomach and transverse colon were adherent to the surface of the tumor, as I have described when treating of the injections of iodine into the sac.

After one cyst has been emptied, the hand may be introduced into it for the purpose of breaking down the partition walls, so that the contents of all the cysts may escape by one common outlet; or each cyst may, in turn, be emptied by a trocar as it presents. When the tumor has been thus sufficiently reduced in size to be drawn out of the abdominal cavity, it should be wrapped up in a towel to preserve its warmth and circulation until the pedicle can be divided. The patient is then to be turned on her back, the abdominal incision held open, so that the small intestines and the parts about the pedicle may be covered by pieces of linen cloth wrung out of warm water to which carbolic acid has been added. This will protect the intestines from cold and from the continued action of the spray, and will absorb any blood which oozes from the walls, or from the pedicle after it has been divided.

A clamp or a strong cord should next be passed around the pedicle, close to the tumor, for a temporary ligature, and the mass divided with a pair of scissors at a safe distance from the constricted point. As the tumor is held up by the assistant, that the cord may be applied, he should not make any traction.

CASE LXI.—I lost a patient in the Woman's Hospital for want of care in this respect. The operation had been a very satisfactory one, and I did not know that undue traction was made by my assistant as I applied the ligature. Shortly after the patient recovered from the effects of the ether, symptoms of loss of blood presented themselves with increasing urgency. The cause was so obvious that I opened the lower angle of the wound, expecting to find hemorrhage from the stump of the pedicle, but on passing a sponge probang down into Douglas's cul-de-sac it was evident that the cavity was even unusually free from bloody serum. I was unable to account for the condition, and death took place in a few hours. A post-mortem examination disclosed a thrombus in the connective tissue under the fascia, which dissected up the pelvic tissue and extended beyond the left kidney. Some vessel in the cellular tissue under the pedicle had been ruptured, several quarts of blood were lost, causing intense suffering to the patient by pressure on the ureter and kidney, and from which she could not be relieved even when stupefied with opium.

After cutting away the tumor and ascertaining that there is no bleeding from the stump, it may be temporarily dropped back into the cavity, the long ends of the ligature being held by an assistant. The tumor being out of the way, a careful inspection must be made to ascertain that no bleeding is taking place from the abdominal walls or from vessels which may have been ligated. Fresh linen cloths, which have been wet in the warm solution of carbolic acid and wrung out nearly dry, may be again spread out over the small intestines to protect them from the chilling effect of the spray, and those over the edges of the incision and peritoneum on the abdominal wall, may be changed.

If the clothing or covering of the patient should have become wet from the escape of the contents from the tumor, these must be removed or rolled up, and dry warm towels laid next to the skin.

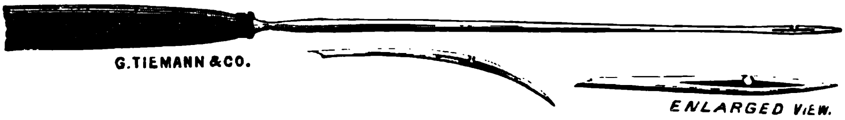
The pedicle may now be finally secured. If a clamp is to be used, the temporary one, which may have been applied instead of a ligature, need not necessarily be removed. If the pedicle is to be ligated, an assistant must lift up the free end of the stump with a tenaculum or by the clamp, if one has been applied, making as little traction as possible. As the stump is held up, the operator will be able to select a point free from bloodvessels through which to pass a needle carrying a double thread forming a loop. By this loop the silk ligature is to be drawn through in two portions of equal length. Unless the pedicle is of unusual thickness, it will be sufficient to tie it in two sections. After cutting the silk so as to make two ligatures, one must be passed around the other so that when they are tied they will be linked together, and not lie independent of each other. If this is not done the pedicle will be apt to split from the point at which the ligatures were passed and give rise to hemorrhage. The ends of the ligatures should be tied at first only in a half-knot on each side, but securely enough to compress the tissues as much as the strength of the silk will permit. Then as the stump of the pedicle is held up with a tenaculum in the hands of an assistant, the temporary ligature should be cut away or the clamp loosened. But before this is done a cloth or sponge must be placed about the pedicle to absorb what blood may escape. The quantity of blood escaping will be small if a half-knot has been already made on each side, for it will require but a second of time for the operator to tighten the first half, and then complete what is called a square knot by the addition of a half-knot afterwards. It is always well thus to loosen the temporary ligature before securing the permanent one, so as to admit of the escape of blood included between the two ligatures, or hemorrhage may afterwards occur. Until the condition of the other ovary has been examined, an assistant will continue to hold the end of the pedicle with a tenaculum, and never by the ends of the ligatures. If the other ovary be found diseased, a double ligature must be passed through its pedicle in the manner just described, and it must be also removed. The ends of all the ligatures are to be cut off as close to the knot as can be done with safety, and the stump of the pedicle then trimmed of all ragged portions not nearer to the ligatures than one inch. The ends of the remaining ligatures in charge of the assistant are in turn to be cut off close, after it has been seen that all bleeding has been arrested by them. All blood-clots are to be removed, and Douglas's cul-de-sac emptied of the fluid which may have gravitated into it. To do this the left hand is to be passed down close to the uterus, with the palm towards the intestines, to push them back, when the sponge probang can be easily passed to the bottom of the cavity. After the cul-de-sac has been emptied a fine, clean, surgical sponge, with a string attached, may be introduced to the bottom of the pouch and left there, with the string outside in charge of an assistant. The linen cloths which had been placed over the small intestines should now be changed for a fresh one, and those over the edges of the abdominal incision are to be removed for the purpose of closing the cavity.

I have met with several instances of umbilical hernia, in connection with ovarian tumors. The first instance coming under my observation was seen by the late Dr. Peaslee in consultation, in 1868, where the ring was dilated sufficiently to admit two fingers. In this case, as in the others, I extended the abdominal section to one side and removed the whole umbilical ring, with a pair of scissors uniting the entire incision in the abdominal wall in one common line.

Metallic sutures are now generally employed for this purpose. Mr.

Wells, however, uses silk. These sutures may be introduced by one of three methods. The most common is by the aid of an awl-shaped instrument, like Dr. Skene's straight needle, or the curved one of Dr. Peaslee, for closing a ruptured perineum.

Fig. 130.



Skene's needle for ruptured perineum.

Near the point of the instrument is an eye through which a loop of thread is inserted. While the instrument is being passed through the tissues the two ends of the loop are to be grasped with the handle and held until the eye, with the thread, has passed through both flaps. After having passed through one flap, the other is to be adjusted in proper relation to the point of the instrument, to secure a perfect coaptation. The wire is now to be attached to the loop of the thread and pulled through the two flaps as the needle is withdrawn.

I am in the habit of using for this purpose a straight thick sewing needle, about two inches long, armed with a loop of thread of a sufficient length, to which the wire has been already attached, and the needle is passed by means of the needle forceps in the following manner: The operator catches up one flap between his thumb and fingers, and forces the needle through the tissues, making the point of exit about an inch from the margin.

Then the opposite lip of the incision is seized in the same manner, and turned out a little, so as to expose the peritoneal surface, that the point of the needle may be introduced at a distance corresponding to its exit from the other flap.

It is advisable to bring together in this manner a broad strip of the peritoneum, whenever it can be done. The peritoneal surfaces will adhere in a few hours, when held in close contact, and prevent pus, or other fluid, passing from the wound into the abdominal cavity. The sutures are to be introduced somewhat in reference to the thickness of the parietes, for should they be thick, unfortunately only a limited portion of the peritoneal surfaces can be brought up in contact by them. The points at which the sutures emerge from the flaps should lie nearer the edges of the incision on the skin surface than they do on the peritoneal surface, because this secures a better coaptation.

I have sometimes attached a needle to each end of a piece of silver wire and passed them through the tissues from within outwards.

When the operator has introduced a suture through the flaps it is to be transferred to the assistant, who should regulate the proper length, and bring together the sides of the incision, by a twist or two of the wire, while the next suture is being passed. The sutures are to be introduced from above downward, a distance of half an inch apart, until all have been passed; but a sufficient number are to be left untwisted at the lower angle of the wound, so as to allow of the removal of the linen cloth spread over the small intestines, and of the sponge which had been left in Douglas's pouch. It will be necessary to pass several fingers between the flaps, down to the sponge, to keep back the intestines while the sponge is being removed. After its removal a sponge probang should be introduced before withdrawing the fingers, to insure that the cul-de-sac has been thoroughly emptied.

If the pedicle has been secured by a clamp it must now be placed at the lower angle of the wound to be held there until all sutures have been secured. Whenever the adhesions have been extensive it is advisable to introduce a drainage tube to the bottom of Douglas's cul-de-sac before the fingers are withdrawn. The assistant should hold it in the lower third of the incision, until all the sutures have been secured. I always require the third assistant to continue the lateral pressure with the palms of his hands spread out over the sides of the abdomen, until the bandage is to be applied, as this controls the oozing by keeping the side of the abdominal wall in close contact with the intestines. Whenever the abdominal parietes are much relaxed, an assistant can keep the peritoneal surfaces bordering on the incision in close contact during the introduction of the sutures. Another advantage of this pressure is that it affords a support, and closes the cavity against the entrance into it of blood from the peritoneal surface, or from the punctures of the needles.

It is advisable to discontinue gradually the inhalation of the ether towards the close of the operation, so that the patient may even be somewhat conscious of the introduction of the last sutures. The final adjustment of the sutures will require some care, that they may not prove a source of irritation. They are to be twisted as when used internally, and after having been bent over flat to the surface of the skin, in the manner directed in the chapter on the use of the silver suture, their ends are to be cut to about half an inch in length.

Throughout the whole progress of the operation the spray should be properly directed, and the open abdominal cavity should be at no time exposed. When the operation has been prolonged, and the spray apparatus is known to be nearly empty, either of water or alcohol, the instrument in reserve must be prepared, and be in good working order over the wound before the other is withdrawn. If, for any cause, there should be an interruption in the action of the spray, the abdomen must be immediately covered with several thicknesses of the gauze cloth, wet with the weakest solution of the carbolic acid, to be uncovered only when the spray is again in operation.

If there is any advantage in the antiseptic method, it can only be secured by observing scrupulously the minutest details. Perhaps in private pracitice, and under some other favorable circumstances, there may be apparently little advantage in it, but in hospital practice, its advantages cannot be questioned.

The spray is to be continued until the bandage has been adjusted. After having sponged off the surface of the abdomen, a piece of "protective," about two inches wide, and wet with the weakest carbolic solution, is to be laid directly over the wound, a hole having been made in it for the drainage tube. Over this, and covering a large portion of the abdomen, is to be spread a single thickness of the gauze cloth also wet with the same solution; then a sufficient quantity of the dry gauze cloth folded into about eight or ten thicknesses, and large enough to reach from the pubes to the ensiform cartilage, and from one crest of the ilium to the other. Between the outer folds, a somewhat smaller piece of the mackintosh is to be spread with the rubber surface downward. Finally, under the patient, must be spread a piece of muslin the size of an obstetrical binder, and split up from each end into a number of tails. These are to cross over the abdomen, interlacing like a many-tailed bandage, and the ends are to be pinned so as to maintain an equable degree of pressure. The spray may now be discontinued, but it will be necessary before completing the dressing to stuff in around the edges of the bandage, about the pubes and ribs, a sufficient quantity of carbolized jute to fill in the spaces. This method, obtained from Dr. Weir, is essentially the one which Mr. Lister has adopted in general surgical practice.

Mr. Wells in his third lecture[1] describes his mode of applying this dressing in the following manner. "The last thing I have tried seems to me to answer better than anything. It is gauze saturated with thymol, the last substitute for carbolic acid. Thymol and spermaceti are mixed together. The gauze is charged with it, and makes a very nice soft antiseptic dressing, which is simply put over the united wound. Eight or ten other folds are put over the first, and then you support the whole with strips of plaster, and the flannel bandage (lined with linen or calico to lessen the irritating action of the flannel on the skin of the patient), and this bandage is tightly fastened over the gauze with safety pins."

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[1] Brit. Med. Jour., July 6, 1878.

Whenever it becomes necessary to disturb this dressing, it must be changed under the spray, with as much care as was exercised during the progress of the operation.

After-Treatment.—As a large proportion of the deaths from ovariotomy are due to shock, special attention should be directed to bringing about a reaction immediately after the operation. Heat should be applied to the patient's body, no matter what the season of the year, and she should be left quiet, in a well ventilated room, of which the temperature is to be maintained at about 65°F. Very little else need be done unless symptoms of prostration should appear, when it may be necessary to give brandy hypodermically or by the rectum until it can be retained by the stomach. Beef tea may also be given with the brandy by the rectum if indicated, a towel being held by the nurse firmly against the anus to prevent its expulsion should a paroxysm of vomiting come on. Hypodermic stimulation is, however, to be resorted to only when immediate effects are demanded, as it not infrequently gives rise to abscesses.

To allay the distressing vomiting which sometimes continues after the ether is withdrawn, a mustard plaster should be placed over the stomach before the patient becomes conscious. Small fragments of ice may be given, and perhaps a little carbolic acid water or champagne if needed. Mr. Keith recommends the sipping of hot water, and it is sometimes very efficient. If the nausea and vomiting are not quieted within a reasonable time, it may become necessary to administer a hypodermic injection of morphia to prevent too great a loss of strength.

After reaction has been established, the stomach should remain at rest for two or three days, having nothing put into it beyond a little cracked ice, and occasionally a spoonful of milk, with as much lime water. All the nourishment should be given by the rectum, and with as little disturbance as possible. Mr. Keith gives no food at all until flatus has begun to escape from the anus; and Dr. Charles Clay, of Manchester, advises that no solid food be given until the patient asks for it.

At any time after the first twenty-four hours, and within a week from the time of the operation, there may be an elevation of temperature and an increase of pulse. Following these, if the progress is unfavorable, there may occur vomiting, pain over the abdomen, and tympanites, and later, diarrhœa of a most offensive character. These are the initial symptoms of peritonitis, and they may be followed in a short time by symptoms of septicæmia, and, later, of pyæmia. It is a question yet to be settled, whether septicæmia is not at the bottom of this unfavorable change. A certain amount of bloody and serous oozing always takes place when adhesions are broken up during the operation. Frequently this is promptly absorbed without producing the slightest disturbance; but, under some unknown circumstances, it is absorbed very slowly, and in a few hours may undergo septic changes, and poison the whole mass of the blood. To secure the safe removal of this "oozed" fluid, and to keep down the patient's temperature, is one of the problems of this branch of surgery. The reduction of temperature does not insure the removal of the blood poison, but it renders the condition of the patient less critical. The higher the temperature above the normal, the greater will be the tissue waste, and the more seriously will the action of the kidneys and other excretory organs be impaired, even to the extent of total arrest, and, of course, death. An increased action of the kidneys, skin, and other excretory organs is essential when blood-poisoning exists. A reduction of the temperature to the normal (that is when it has not been brought about by exhaustion) favors functional activity, and secures a more rapid elimination of septic material, and affords time for the institution of remedial measures.

Among the so-called antipyretics, quinine is the only one which is worthy of confidence. To produce a marked effect it must be given in large doses; but the stomach, in its irritable state, is not apt to tolerate any drug, and the absorbing power of the rectal mucous membrane is too slight to enable us to expect great results from the introduction of remedies in that direction. The external application of cold, dry or wet, has, from time to time, been highly extolled for the reduction of temperature, but hitherto the difficulties in the way of its application have greatly limited its use.

Dr. Richardson seems to have been the first ovariatomist who employed cold, by means of an ice-bag about the neck, with a view of directly lowering the temperature of the blood going to the brain and nerve centres. But his method was crude and inconvenient, and it proved impossible to keep the ice-bag in position.

At length, Mr. J. K. Thornton, of London, suggested an improved ice-cap in the form of a coil of small India-rubber tubing, through which a constant current of ice water was made to flow. This arrangement has met with Mr. Wells's entire approval, and he states[1] that "it is very seldom that within an hour the effect upon the patient cannot be distinctly proved by the thermometer, and I believe in many cases it has been of very signal service."

Yet it is evident that, for speedily reducing the temperature of the whole body, the application of cold to the head alone is limiting it to too small an area, although my own experience does not extend beyond the use of the cold cap and sponging of the face and extremities. To Dr. T. G. Thomas we are indebted for information as to the most effective means[2] for applying cold to the body, and from it we are promised an advance in ovariotomy second only in importance to that made by the introduction of "Listerizing."

Dr. Thomas has used at the Woman's Hospital the "fever-cot" of the late Dr. G. W. Kibbee, who died in the discharge of his duty, as a volunteer, during the recent (1878) epidemic of yellow fever in New Orleans, where he was experimenting with his cot in the treatment of that disease.

The "fever-cot" is essentially the same as the low, narrow and folding cot so commonly used as a temporary bed. A strong elastic cotton netting is substituted for the stretched canvas, and beneath this, for the whole length, and from one side to the other, hangs a piece of rubber cloth. The water readily runs through this netting to the rubber cloth below, which, hanging loose, forms a gutter, and conveys the water to a bucket, or other receptacle, at the foot of the bed.

The following is Dr. Thomas's description of his method.

"Upon this cot a folded blanket is laid so as to protect the patient's body from cutting by the cords of the netting, and at one end is placed a pillow covered with India-rubber cloth, and a folded sheet is laid across the middle of the cot about two-thirds of its extent. Upon this the patient is now laid, her clothing is lifted up to the arm-pits, and the body enveloped by the folded sheet, which extends from the axillæ to a little below the trochanters. The legs are covered by flannel drawers, and the feet by warm woolen stockings, and against the soles of the latter bottles of warm water are placed. Two blankets are then placed over her, and the application of water is made. Turning the blankets down below the pelvis, the physician now takes a large pitcher of water at from 75° to 80° and pours it gently over the sheet. This it saturates, and then, percolating the network, it is caught by the India-rubber apron beneath, and, running down the gutter formed by this, is received in a tub placed at its extremity for that purpose. Water at higher or lower degrees of heat than this may be used. As a rule, it is better to begin with a high temperature, 85° or even 90°, and gradually diminish it.

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[1] Fifth lecture, Brit. Med. Journ., July 13, 1878.

[2] The most effectual method for controlling the high temperature occurring during ovariotomy, New York Med. Journ., August, 1878.

"The patient now lies in a thoroughly soaked sheet with warm bottles to her feet, and is covered up carefully with dry blankets. Neither the portion of the thorax above the shoulders nor the inferior extremities are wet at all. The water is applied only to the trunk. The first effect of the affusion is often to elevate the temperature, a fact noticed by Currie himself; but the next affusion, practised at the end of an hour, pretty surely brings it down. It is better to pour water at a moderate degree of coldness over the surface for ten or fifteen minutes than to pour a colder fluid for a shorter time. The water slowly poured robs the body of heat more surely than when used in the other way. The water collected in the tub at the foot of the bed, having passed over the body, is usually 8° or 10° warmer than it was when poured from the pitcher. On one occasion Dr. Van Vorst, my assistant, tells me that it had gained 12°.

"At the end of every hour the result of the affusion is tested by the thermometer; and, if the temperature has not fallen, another affusion is practised, and this is kept up until the temperature comes down to 100° or even less.

"It must be appreciated that the patient lies constantly in a cold wet sheet; but this never becomes a fomentation, for the reason that as soon as it abstracts from the body sufficient heat to do so, it is again wet with cold water and goes on still with its work of heat abstraction. I have kept patients upon this cot enveloped in the wet sheet for two and three weeks, without discomfort to them, and with the most marked control over the degree of animal heat. Ordinarily after the temperature has come down to 99° or 100°, four or five hours will pass before affusion again becomes necessary."

"Recognizing in this a method by which cold could be applied to the surface for any length of time without fatigue or exhaustion to the patient, and without the danger of excessive chilling, since any great depression of temperature can be obviated by the affusion of warm water, I determined at once to adopt it after ovariotomy."

Dr. Thomas has given the history of eight cases treated by this method, and the fact is clearly established by these records that the rise in temperature can be kept under control.

The reduction of temperature is all very well, so far as it goes, but the patient will die in spite of it, unless the decomposing bloody serum is removed from the peritoneal cavity.

If a drainage tube has been left, communicating through the abdominal incision with Douglas's cul-de-sac, it can be ascertained if an accumulation of fluid has taken place there. This tube should be kept well corked until symptoms of blood poisoning arise, when it is to be opened frequently to admit of the escape of any fluid that may be in the cavity; and a hard rubber syringe with a long narrow nozzle tipped with an inch or so of small tubing perforated with one or more small holes, should be passed to the bottom of the drainage tube to remove what has not run out. Afterwards a weak solution of carbolic acid in warm water should be injected with the greatest care, and continued until the fluid begins to return through the tube, when it is to be drawn out with the syringe, and the injection repeated until the water returns clear. This must be done as often as may be indicated, for when the quantity is great it may be necessary, in some cases, to wash out the cavity every hour or two, while in others, twice in the twenty-four hours will be sufficient.

A cup sponge, which has been saturated with a solution of carbolic acid, can be kept over the mouth of the drainage tube after the first dressing. If any portion of the bandage is found wet and soiled by the discharge, or any odor can be detected, the dressing must be changed, and always under the spray.

The final removal of this drainage tube will depend on circumstances, but it should be withdrawn in five or six days if possible. It soon becomes surrounded by lymph, which forms a canal to the bottom of Douglas's cul-de-sac, and the pressure of the glass tube is more or less irritating, and excites a discharge which would not otherwise take place. After the fourth day, if it cannot be dispensed with, a shorter glass tube, or a piece of rubber tubing, should be used, the size to be reduced from day to day both as to length and diameter. To prevent the tubing from slipping into the abdominal cavity, a loop of thread should be fastened to its outer end. When no drainage tube has been used, and symptoms of blood poisoning come on, the lowest angle of the wound must be opened, under the spray, with a probe, and the position of the patient changed to aid the escape of any fluid in the cavity. A vaginal examination must also be made, and if any fluid can be detected in Douglas's pouch, it must be at once evacuated by puncture.

The tympanites which always exists more or less, in even the most favorable cases, can be only palliated if excessive. Ten or twenty drops of chloroform, with as many grains of powdered camphor dissolved in it, and administered in a little gum water, will sometimes give relief when the stomach is sufficiently quiet to tolerate any remedy. The application of dry heat to the abdomen is always grateful, and frequently the only relief which can be gained is through changing the patient's position. This can be done without much disturbance, by lifting one side of the mattress, and placing a pillow under it; this will shift the position of the patient sufficiently to one side to give temporary relief.

The catheter should be introduced for four or five days, after which it will be safe to move the patient sufficiently to use the bed-pan. It is scarcely ever necessary to cause the bowels to act before the end of the first week, and then it is better to employ an enema of warm water, and a little Castile soap for the purpose.

I feel fully satisfied, from my own observation, that much harm has been done by the indiscriminate use of opium after ovariotomy. Under some circumstances the effect of opium seems to increase the action of the kidneys, but, as a rule, its secondary effect, if not its primary one, is to diminish the secretion, particularly of the skin. Opium is unquestionably a valuable remedy, and should be used without hesitation when needed. It often serves to economize the patient's strength by allaying pain, and by producing sleep. Its use is also essential to hold in check the early vomiting of peritonitis, but it should never be used as a prophylaxis against its occurrence. The plan so often followed of giving large doses of opium from the beginning, and of keeping the patient fully under its influence, has killed a great number by arresting the secreting or eliminating processes.

As long as the patient seems to be doing well, the bandage ought not to be disturbed until the sutures are to be removed, which, if they are of silk, ought to be in four or five days, and if metallic, at the end of one week. When the course of the convalescence has been favorable, the patient is generally able to sit up for a short time at the end of the second week, and in from four to six weeks she may be able to return home. She should continue to use an abdominal bandage for several months after the operation. This will give support to the tissues which have been so long overstretched, and will at the same time guard against a separation along the line of incision, and the occurrence of a hernia.

We cannot conclude this subject in a more appropriate manner than by presenting to the reader, the latest views of Mr. Wells and Mr. Keith regarding the antiseptic mode of treatment.

Mr. Wells has stated in one of his lectures, "I think I have already noticed a considerable difference in the progress of cases after operation since I began to use carbolic acid and thymol. There has distinctly been less elevation of temperature in every one of the cases than I have ever, or only exceptionally, seen before. I may say that, in antiseptic ovariotomy, fever is the exception, when as formerly it was the rule."

Mr. Wells, in addition, states that in his hospital practice, for the past two years, he had had ninety per cent. of recoveries.

Mr. Keith's success in this operation had been unequalled previous to employing Lister's method, and the effect of its adoption and the advantage gained cannot be better expressed than in his own words.[1] "Without antiseptics, my results over fourteen years gave a mortality of almost 1 in 7. Of the five years preceding the use of the spray, nearly 1 in 10½, of the last of these five years 1 in 21. To what then are these results to be attributed?" He attributes this success first to the use of the drainage tube, which has been described, and states, "I am as certain as I am of my existence, that, had I used them earlier and oftener, the mortality would have been less by one-third." He next rates in value the use of the cautery in dividing the pedicle; then the compression forceps in large numbers to prevent loss of blood; and finally the substitution of ether for chloroform. "All these things have, I think, helped to lessen the mortality, but the drainage and the employment of the cautery in the division of the pedicle, have contributed most."

"What then have we gained by antiseptics in ovariotomy? 1. It has lessened the mortality. Take the results of the German surgeons. After the first trials even, the mortality fell at once from 50 per cent. to 20: thirty lives saved by the spray alone out of every hundred. When I add that my last forty-one have all recovered, enough has been said. No such successful series was ever got in the old way." . . . "2. This increased safety will encourage medical men to recommend earlier operations, which certainly few of them now do. That very large tumors and bad adhesions increase the mortality there can be doubt. For the last seven years, no death happened to me in non-adherent tumors, and the deaths that occurred during that period were, with a single exception, in cases where the local difficulties prolonged the operation for two hours or more. Certainly early operations, when a cyst bursts, and fluid is thrown out in a large quantity into the peritoneum, cannot be too strongly urged. 3. With antiseptic ovariotomy, the drainage tube will not be nearly so often required. I do not think that it can be altogether dispensed with. No one has practised drainage so much as I have, yet I know well that it sometimes cannot be used without risk." "With antiseptics the tube can be removed much earlier." 4. "Convalescence is rendered easier. 5. Antiseptics are a great comfort and relief to the operator. Speaking for myself, the difference is enormous; ovariotomy is not the operation it was fifteen or sixteen years ago, or even two years ago." "This long despised operation is now the safest of all the great surgical operations, at least judging from the results, twelve deaths of the last one hundred and fifty-six, three of the last seventy-five, and no deaths of the last forty-one operations."

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[1] Results of Ovariotomy before and after Antiseptics, by T. Keith, F.R.C.S., Edinburgh, British Medical Journal, Oct. 19, 1878.

The introduction of the antiseptic method justifies us now in undertaking the removal of ovarian tumors at a much earlier stage of their growth. In some cases at least one year may thus be gained.

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